UNINTELLIGENT DESIGN • **PBS BURIES TRUTH ON TURIN SHROUD** • *THE FABRIC OF THE COSMOS*

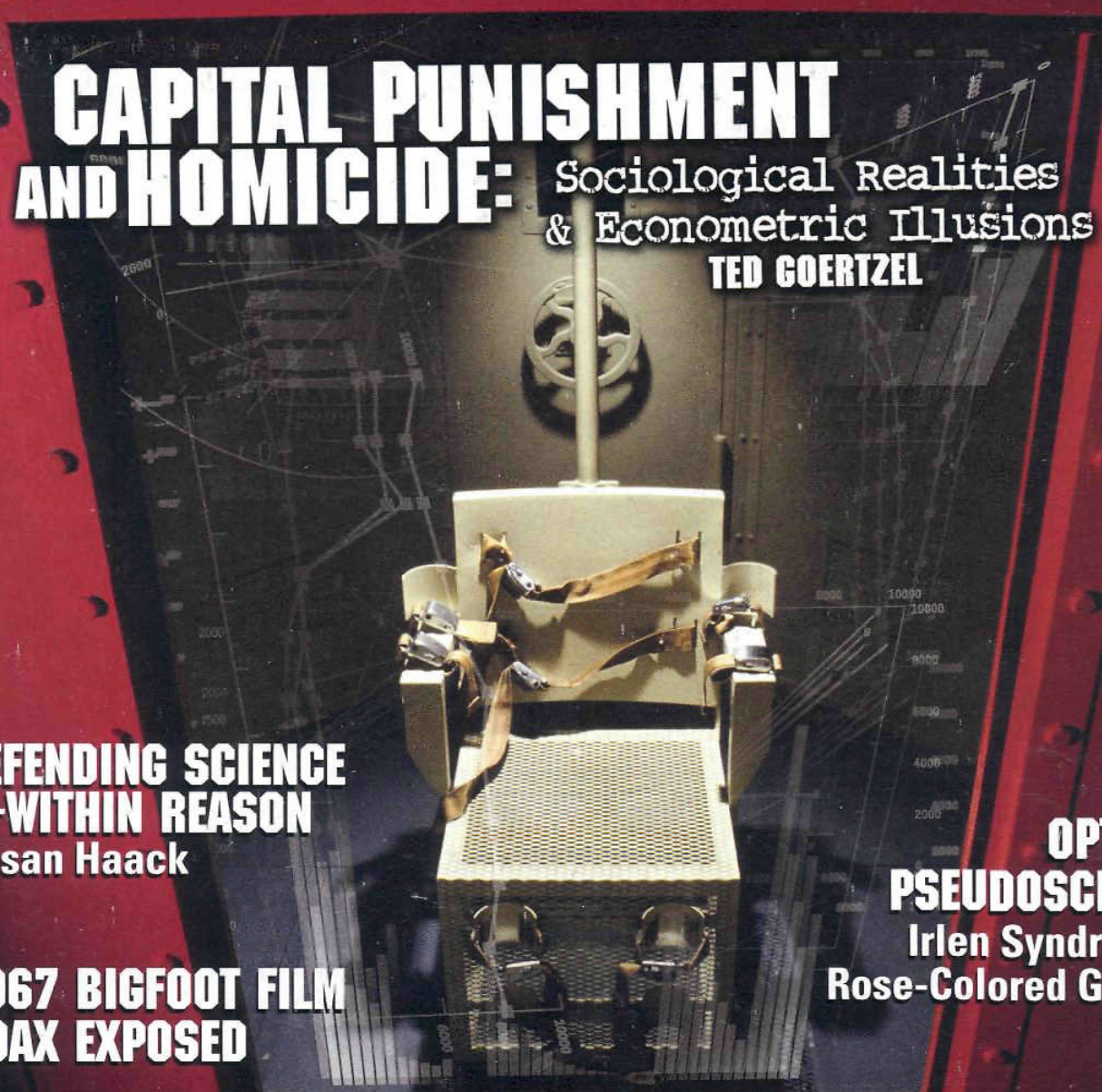
Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

Volume 28, No. 4 • July / August 2004

CAPITAL PUNISHMENT AND HOMICIDE: Sociological Realities & Econometric Illusions

TED GOERTZEL



DEFENDING SCIENCE —WITHIN REASON

Susan Haack

OPTICAL PSEUDOSCIENCE: Irlen Syndrome's Rose-Colored Glasses

1967 BIGFOOT FILM HOAX EXPOSED

PRANKS, FRAUDS, AND HOAXES

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

07>

0 56698 80575 5

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION

of Claims of the Paranormal

AT THE CENTER FOR INQUIRY–*INTERNATIONAL* (ADJACENT TO THE STATE UNIVERSITY OF NEW YORK AT BUFFALO)

AN INTERNATIONAL ORGANIZATION

Paul Kurtz, Chairman; professor emeritus of philosophy, State University of New York at Buffalo
Barry Karr, Executive Director
Joe Nickell, Senior Research Fellow
Richard Wiseman, Research Fellow
Massimo Polidoro, Research Fellow
Lee Nisbet, Special Projects Director

FELLOWS

James E. Alcock,* psychologist, York Univ., Toronto
Jerry Andrus, magician and inventor, Albany, Oregon
Marcia Angell, M.D., former editor-in-chief, *New England Journal of Medicine*
Robert A. Baker, psychologist, Univ. of Kentucky
Stephen Barrett, M.D., psychiatrist, author, consumer advocate, Allentown, Pa.
Barry Beyerstein,* biopsychologist, Simon Fraser Univ., Vancouver, B.C., Canada
Irving Biederman, psychologist, Univ. of Southern California
Susan Blackmore, Visiting Lecturer, Univ. of the West of England, Bristol
Henri Broch, physicist, Univ. of Nice, France
Jan Harold Brunvand, folklorist, professor emeritus of English, Univ. of Utah
Vern Bullough, professor of history, California State Univ. at Northridge
Mario Bunge, philosopher, McGill University
John R. Cole, anthropologist, editor, National Center for Science Education
Frederick Crews, literary and cultural critic, professor emeritus of English, Univ. of California, Berkeley
F. H. C. Crick, biophysicist, Salk Inst. for Biological Studies, La Jolla, Calif; Nobel laureate
Richard Dawkins, zoologist, Oxford Univ.
Geoffrey Dean, technical editor, Perth, Australia
Daniel C. Dennett, *University Professor and Austin* B. Fletcher Professor of Philosophy, Director of the Center for Cognitive Studies at Tufts University
Cornelis de Jager, professor of astrophysics, Univ. of Utrecht, the Netherlands
Paul Edwards, philosopher, editor, *Encyclopedia of Philosophy*
Kenneth Feder, professor of anthropology, Central Connecticut State Univ.
Antony Flew, philosopher, Reading Univ., U.K.
Andrew Fraknoi, astronomer, Foothill College, Los Altos Hills, Calif.
Kendrick Frazier, science writer, editor, SKEPTICAL INQUIRER
Yves Galifret, vice-president, Affiliated Organizations: France
Martin Gardner, author, critic
Murray Gell-Mann, professor of physics, Santa Fe Institute; Nobel laureate
Thomas Gilovich, psychologist, Cornell Univ.
Henry Gordon, magician, columnist, Toronto
Saul Green, Ph.D., biochemist, president of ZOL Consultants, New York, NY
Susan Haack, Cooper Senior Scholar in Arts and Sciences, prof. of philosophy, University of Miami
C. E. M. Hansel, psychologist, Univ. of Wales
Douglas Hofstadter, professor of human understanding and cognitive science, Indiana Univ.
Gerald Holton, Mallinckrodt Professor of Physics and professor of history of science, Harvard Univ.
Ray Hyman,* psychologist, Univ. of Oregon
Leon Jaroff, sciences editor emeritus, *Time*
Sergei Kapitza, former editor, Russian edition, *Scientific American*
Philip J. Klass, aerospace writer, engineer
Lawrence M. Krauss, author and professor of physics and astronomy, Case Western Reserve University
Edwin C. Krupp, astronomer, director, Griffith Observatory
Paul Kurtz,* chairman, Center for Inquiry
Lawrence Kusche, science writer
Leon Lederman, emeritus director, Fermilab; Nobel laureate in physics
Scott Lilienfeld, psychologist, Emory Univ.
Lin Zixin, former editor, *Science and Technology Daily* (China)
Jere Lipps, Museum of Paleontology, Univ. of California, Berkeley
Elizabeth Loftus, professor of psychology, Univ. of California, Irvine
Paul MacCready, scientist/engineer, AeroVironment, Inc., Monrovia, Calif.
John Maddox, editor emeritus of *Nature*
David Marks, psychologist, City University, London.
Mario Mendez-Acosta, journalist and science writer, Mexico City, Mexico
Marvin Minsky, professor of media arts and sciences, M.I.T.
David Morrison, space scientist, NASA Ames Research Center
Richard A. Muller, professor of physics, Univ. of Calif., Berkeley
H. Narasimhaiah, physicist, president, Bangalore Science Forum, India
Joe Nickell,* senior research fellow, CSICOP
Lee Nisbet,* philosopher, Medaille College
Bill Nye, science educator and television host, Nye Labs
James E. Oberg, science writer
Irmgard Oepen, professor of medicine (retired), Marburg, Germany
Loren Pankratz, psychologist, Oregon Health Sciences Univ.
John Paulos, mathematician, Temple Univ.
Steven Pinker, cognitive scientist, MIT
Massimo Polidoro, science writer, author, executive director CICAP, Italy
Milton Rosenberg, psychologist, Univ. of Chicago
Wallace Sampson, M.D., clinical professor of medicine, Stanford Univ., editor, *Scientific Review of Alternative Medicine*
Amardeo Sarma, manger NEC Europe Ltd., executive director, GWUP, Germany.
Evry Schatzman, former president, French Physics Association
Eugenie Scott, physical anthropologist, executive director, National Center for Science Education
Robert Sheaffer, science writer
Elie A. Shneour, biochemist, author, director, Biosystems Research Institute, La Jolla, Calif.
Dick Smith, film producer, publisher, Terrey Hills, N.S.W., Australia
Robert Steiner, magician, author, El Cerrito, Calif.
Victor J. Stenger, emeritus professor of physics and astronomy, Univ. of Hawaii; adjunct professor of philosophy, Univ. of Colorado
Jill Cornell Tarter, astronomer, SETI Institute, Mountain View, Calif.
Carol Tavris, psychologist and author, Los Angeles, Calif.
David Thomas, physicist and mathematician, Peralta, New Mexico
Stephen Toulmin, professor of philosophy, Univ. of Southern California
Neil deGrasse Tyson, astrophysicist and director, Hayden Planetarium, New York City
Marilyn vos Savant, *Parade* magazine contributing editor
Steven Weinberg, professor of physics and astronomy, Univ. of Texas at Austin; Nobel laureate
E.O. Wilson, University Professor Emeritus, Harvard University
Richard Wiseman, psychologist, University of Hertfordshire
Marvin Zelen, statistician, Harvard Univ.

* Member, CSICOP Executive Council
(Affiliations given for identification only.)

• • • Visit the **CSICOP** Web site at http://www.csicop.org • • •

The SKEPTICAL INQUIRER (ISSN 0194-6730) is published bimonthly by the Committee for the Scientific Investigation of Claims of the Paranormal, 1310 Sweet Home Rd., Amherst, NY 14228. *Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices.* Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $4.95. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or MasterCard.

Inquiries from the media and the public about the work of the Committee should be made to Paul Kurtz, Chairman, CSICOP, Box 703, Amherst, NY 14226-0703. Tel.: 716-636-1425. FAX: 716-636-1733.

Manuscripts, letters, books for review, and editorial inquiries should be addressed to Kendrick Frazier, Editor, SKEPTICAL INQUIRER, 944 Deer Drive NE, Albuquerque, NM 87122. Fax 505-828-2080. Before submitting any manuscript, please consult our Guide for Authors for format and references requirements. It is on our Web site at http://www.csicop.org/si/guide-for-authors.html and on page 63 of the September/October 2003 issue. Or you may send a fax request to the editor.

Articles, reports, reviews, and letters published in the SKEPTICAL INQUIRER represent the *views and work of individual authors. Their publication does not necessarily constitute an endorsement* by CSICOP or its members unless so stated.

Copyright ©2004 by the Committee for the Scientific Investigation of Claims of the Paranormal. All rights reserved. The SKEPTICAL INQUIRER is available on 16mm microfilm, 35mm microfilm, and 105mm microfiche from University Microfilms International and is indexed in the Reader's Guide to Periodical Literature.

Subscriptions and changes of address should be addressed to: SKEPTICAL INQUIRER, Box 703, Amherst, NY 14226-0703. Or call toll-free 1-800-634-1610 (outside U.S. call 716-636-1425). Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. SKEPTICAL INQUIRER subscribers may not speak on behalf of CSICOP or the SKEPTICAL INQUIRER.

Postmaster: Send changes of address to SKEPTICAL INQUIRER, Box 703, Amherst, NY 14226-0703.

Skeptical Inquirer

July/August 2004 • VOL. 28, NO. 4

ARTICLES

23 Capital Punishment and Homicide
Sociological Realities and Econometric Illusions
Does executing murderers cut the homicide rate or not? Comparative studies show there is no effect. Econometric models, in contrast, show a mixture of results. Why the difference? And which is the more reliable method?
TED GOERTZEL

28 Defending Science—Within Reason
The Critical Common-sensist Manifesto
A noted philosopher of science proposes a "Critical Common-sensist" account of how science proceeds, which she believes can correct the over-optimism of the Old Deferentialism toward science without succumbing to the factitious despair of the anti-scientific New Cynicism.
SUSAN HAACK

35 Exposing Roger Patterson's 1967 Bigfoot Film Hoax
New revelations shed light on a world-famous, much-debated film supposedly showing a Bigfoot creature.
KAL K. KORFF and MICHAELA KOCIS

41 Pranks, Frauds, and Hoaxes from Around the World
It's pretty easy to hoax people. We all want to be deceived, but only up to a point. Some hoaxes are fun and pleasant, others malicious and unpleasant. We'd like a way to tell the difference.
ROBERT CARROLL

47 Seeing the World Through Rose-colored Glasses
Scotopic Sensitivity / Irlen Syndrome
Helen Irlen and her followers claim that dyslexia, attention deficit hyperactivity disorder, and autism are all associated with "Scotopic Sensitivity Syndrome," and each can be effectively treated using colored lenses and overlays. The scientific evidence suggests otherwise.
ALAN D. BOWD and JULIA O'SULLIVAN

SPECIAL REPORT

8 PBS 'Secrets of the Dead' Buries the Truth about Turin Shroud
JOE NICKELL

COLUMNS

EDITOR'S NOTE
Same Data, Opposite Conclusions: What Gives? 4

NEWS AND COMMENT
Mexican Air Force UFOs Likely Equipment Artifacts / Report: Looming Shortage of Scientists / Psychic's False Bomb Tip Cancels Flight / Jeffrey, the Southern Sham: Ghost Photo Consultant Nonexistent / Photographs Shown to Trigger False Memories .. 5

INVESTIGATIVE FILES
Mythical Mexico
JOE NICKELL 11

THINKING ABOUT SCIENCE
Skepticism, a Philosophical Viewpoint
MASSIMO PIGLIUCCI 16

NOTES ON A STRANGE WORLD
Down with Darwin!
MASSIMO POLIDORO 18

PSYCHIC VIBRATIONS
Toutatis Threatens Totally
ROBERT SHEAFFER 20

NEW BOOKS 58

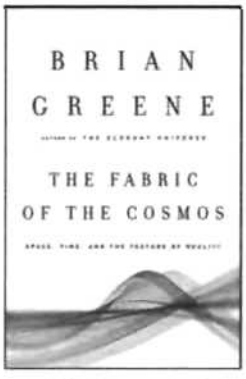
SCIENCE BEST SELLERS 58

FORUM
Fictional Cops Slay Imaginary Giant Critter
ED KEMMICK 59

Missing Time with Art Bell
ALEXANDER D. ALLINS 61

LETTERS TO THE EDITOR 64

BOOK REVIEWS



The Fabric of the Cosmos
By Brian Greene
JAMES N. GARDNER 51

Unintelligent Design
By Mark Perakh
MATT YOUNG 53

Everything and More: A Compact History of Infinity
By David Foster Wallace

The Doctors' Plague: Germs, Childbed Fever, and the Strange Story of Ignac Semmelweis
By Sherwin B. Nuland
GREG MARTINEZ 55

The Power of Reinforcement
By Stephen Ray Flora
PETER LAMAL 57

EDITOR'S NOTE

Same Data, Opposite Conclusions: What Gives?

The first two articles in this issue—both by prominent scholars—have much in common. Both deal with how to assess competing views about certain aspects of the world—cases where the data are the same but different groups of people come to opposite conclusions.

Sociologist Ted Goertzel addresses a problem that's common when the social sciences attempt to consider public policy issues: Each side quotes studies that support its view and disparages the other side. Both sides use the same data. The result is that research evidence itself is denigrated and taken less seriously. His specific topic is homicide rates and capital punishment: Are the former influenced by the latter? This isn't an ethical question; it's an empirical one. Studies that compare trends in states and countries that practice capital punishment with those that do not consistently show that capital punishment has no effect on homicide rates. Studies that use econometric modeling show a mixture of results. But, as Goertzel says, this cannot be a matter of taste. It cannot be that capital punishment deters homicide for one group of researchers but not for another. He shows that comparative studies have produced valid, useful, and consistent findings—widely replicable and reliable—while econometric studies "have failed in this and every similar area of research." He discusses why this is so.

Philosopher Susan Haack's subject is science itself—and different social attitudes toward it. She thoughtfully seeks a middle-ground view—one based on both critical thinking and common sense—between those who denigrate, distrust, and resent science for all manner of perceived grievances against it and those who are excessively deferential toward science. The one view might be labeled *antiscientific,* the other *scientistic.* The problem is to know when the suspicion, or the deference, is excessive. She brings her philosopher's mind to the task of disentangling the confusions. Her "Critical-Commonsensism" acknowledges that there are objective standards of better or worse evidence and better or worse conducted inquiry. And the human side of science—that it is a deeply social enterprise—she finds "not as obstacles to an understanding of how the sciences have achieved their remarkable successes, but as part of such an understanding."

* * *

A third article, by investigative journalists Kal Korff and Michaela Kocis, describes in some detail the exposure as a hoax—long suspected but never proved—of the famous 1967 Roger Patterson film of a Bigfoot walking into the woods. Greg Long's recent book (Korff worked with him and wrote the foreword) identifies where the gorilla costume made to emulate a Bigfoot was manufactured and sold, who wore it for the filming, why Patterson carried out the hoax, and other key details. Much of Long's exposé resulted from interviews with those who knew about, and even helped conduct, the hoax.

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

EDITOR
Kendrick Frazier

EDITORIAL BOARD
James E. Alcock
Barry Beyerstein
Thomas Casten
Martin Gardner
Ray Hyman
Philip J. Klass
Paul Kurtz
Joe Nickell
Lee Nisbet
Amardeo Sarma
Béla Scheiber

CONSULTING EDITORS
Robert A. Baker
Susan J. Blackmore
John R. Cole
Kenneth L. Feder
C. E. M. Hansel
E. C. Krupp
Scott O. Lilienfeld
David F. Marks
Eugenie Scott
Richard Wiseman

CONTRIBUTING EDITORS
Chris Mooney
James E. Oberg
Robert Sheaffer
David E. Thomas

MANAGING EDITOR
Benjamin Radford

ART DIRECTOR
Lisa A. Hutter

PRODUCTION
Christopher Fix
Paul Loynes

EDITORIAL ASSISTANT
David Park Musella

CARTOONIST
Rob Pudim

WEB PAGE DESIGN
Patrick Fitzgerald, Designer
Amanda Chesworth
Kevin Christopher
Rob Beeston

PUBLISHER'S REPRESENTATIVE
Barry Karr

CORPORATE COUNSEL
Brenton N. VerPloeg

BUSINESS MANAGER
Sandra Lesniak

FISCAL OFFICER
Paul Paulin

DEVELOPMENT OFFICERS
Richard Hull
James Kimberly
Sherry Rook

CHIEF DATA OFFICER
Michael Cione

STAFF
Darlene Banks
Julie Beauchamp
Patricia Beauchamp
Matthew Cravatta
Jennifer Miller
Heidi Shively
Anthony Santa Lucia
John Sullivan
Vance Vigrass

PUBLIC RELATIONS DIRECTOR
Kevin Christopher

EDUCATIONAL DIRECTOR
Amanda Chesworth

INQUIRY MEDIA PRODUCTIONS
Thomas Flynn

DIRECTOR OF LIBRARIES
Timothy S. Binga

The SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal, an international organization.

Mexican Air Force UFOs Likely Equipment Artifacts

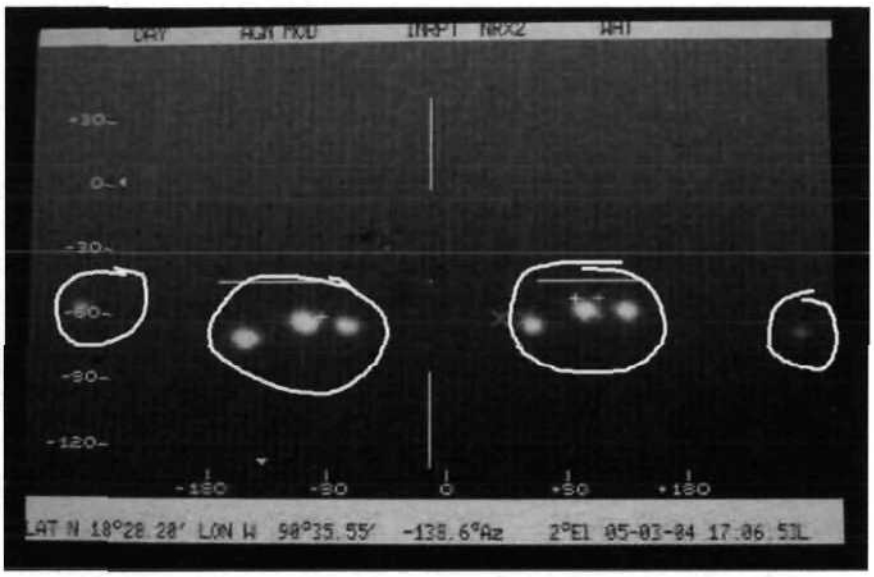
KEVIN CHRISTOPHER

On March 5, 2004, a Mexican Air Force plane recorded bright, blurred orbs on its infrared imaging system over Campeche state. The pilots reported that their radar detected strange objects flying nearby during a routine drug surveillance flight, and their infrared camera showed eleven blobs of light, invisible to the eye, hovering and darting around the aircraft.

Several weeks later, on April 22, Mexican Defense Secretary Ricardo Vega Garcia gave video footage of the encounter to Jaime Maussan, a UFOlogist and television journalist who hosts *Los Grandes Misterios del Tercer Milenio* (Great Mysteries of the Third Millennium), broadcast on the Mexican TV network Multimedios Television. "This is historic news," he told reporters during a May 11 press conference. "Hundreds of videos (of UFOs) exist, but none had the backing of the armed forces of any country. . . . The armed forces don't perpetuate frauds." Maussan screened a fifteen-minute segment from the tape for reporters.

As Mexican and international media published photographs of the objects, UFO Web sites cited the case as evidence of some form of extraterrestrial life. As of this writing, Secretary Vega Garcia insisted that the military had reached no conclusions about the images.

"There are seven observations we can make about the objects seen in the video," says James McGaha, a retired U.S. Air Force major, astronomer, and technical consultant for the Committee for the Scientific Investigation of Claims of the Paranormal. "They move in a straight line. They are at approximately the same altitude as aircraft—ten thousand feet. They show no vertical motion. They move at a constant velocity, no acceleration. Duplicated images occur. Distances are uniform within each formation. They are bright images



that are out of focus. All of these observations are consistent with internal system generated images, that is, reflections, noise, or mirages. It's important to note that the pilots never saw these objects visually, only through the infrared imaging system. It's very likely that they used the system incorrectly and that this misuse generated spurious targets."

McGaha also dismissed skeptics and scientists who have rushed to seemingly reasonable explanations that are inconsistent with the facts already known. "There is no evidence that the objects in the video are flying saucers from another world," says McGaha. "The ridiculous claims of believers are bad enough, but it's even worse to see skeptics and scientists engaging in unwarranted speculation. It is unfortunate that they have come out with suggestions that it was ball lighting, fireballs, meteors, or other re-entering debris. This is just nonsense. These atmospheric phenomena do not persist anywhere near as long as the images recorded on the video did."

Kevin Christopher is Public Relations Director for CSICOP.

Report: Looming Shortage of Scientists

If the current trends persist, while the nation's need for people trained in the fields of science and engineering continues to grow, the number of Americans prepared to fulfill that need will either decline or, at best, remain constant, according to a new report from the National Science Board. That report goes on to warn that this could cripple the United States, both economically and in terms of its national security.

The National Science Foundation report, "An Emerging and Critical Problem of the Science and Engineering Labor Force," a companion to the latest edition of its annual "Science and Engineering Indicators," strongly urges the federal government and the American educational system to begin immediately developing new programs and strengthening existing ones that encourage students to choose career paths in the sciences. A failure to do so could have devastating results: Robert C. Richardson, who won the Nobel Prize for Physics in 1996, is quoted by *The New York Times* as saying, "I fear irreversible damage can be done."

In recent decades, America has relied on people from foreign countries to fill science and engineering positions in the U.S. to make up for this domestic deficit. But now, the report warns, due to increasing international competition for this component of the scientific workforce and mounting security roadblocks for foreign nationals entering the United States, that pool of scientifically skilled labor may be drying up.

Though education is clearly the key, the report says there are no quick fixes to the problem. Training new scientists must begin early; ideally, students choose these career paths in middle school, allowing them to take the necessary courses to prepare them for further secondary and post-secondary studies. Thus, even if a remedial program were put in place today, it would take fourteen or more years before it saw fruition.

The report recommends that everyone encourage and promote the study of science: "The investments involved in growing a workforce trained in science and engineering must be made at local, state, and national levels, and in every region. . . . Quality education in math and science is everyone's challenge and responsibility."

—David Park Musella

David Park Musella is an editorial assistant for the SKEPTICAL INQUIRER.

Psychic's False Bomb Tip Cancels Flight

In March 2004, a self-described psychic claimed that a bomb might be aboard American Airlines Flight 1304 at Southwest Florida International Airport. An airline spokesman said his company was told of the threat by the Transportation Security Administration (TSA), which is part of the Department of Homeland Security. The flight was to leave for Dallas, Texas, at about 12:45 P.M. The bomb report resulted in a preboarding search by the TSA and Port Authority police; despite a thorough examination with both equipment and bomb-sniffing dogs, nothing suspicious was found.

The delay caused by the psychic's tip forced cancellation of the flight, and all 128 passengers were placed on later flights, most delayed until the following day. Doug Perkins, local administrator for the TSA, said, "We were notified early today of a call that was made by a supposed psychic that said there may be a bomb on board an aircraft." Perkins defended taking the psychic tip seriously because "we can't ignore anything. We want to take the appropriate measures."

Perkins did not explain why information from psychics would be taken any more seriously than information from other discredited sources such as astrology, dowsing, or haruspicy (examining the entrails of disemboweled animals). The TSA officials refused to reveal the psychic's identity or even say where the call came from.

It is also unclear why the false bomb information was not treated as a federal crime: according to the Department of Justice's *Criminal Resource Manual*, Section 35 of Title 18 (Prosecutive Policy for Imparting or Conveying False Information—Bomb Hoax) "provides civil and criminal felony provisions for the conveyance of false information regarding attempts or alleged attempts to destroy, damage, or disable aircraft, aircraft related facilities or motor vehicles and their related facilities." In fact, another section, "Prosecution Policy for False Information," suggests that "Aggravated cases should be fully investigated and prosecuted. Such aggravated cases include. . . . False information not readily disclosed as such resulting in delay of the flight or inconvenience to airport employees and passengers."

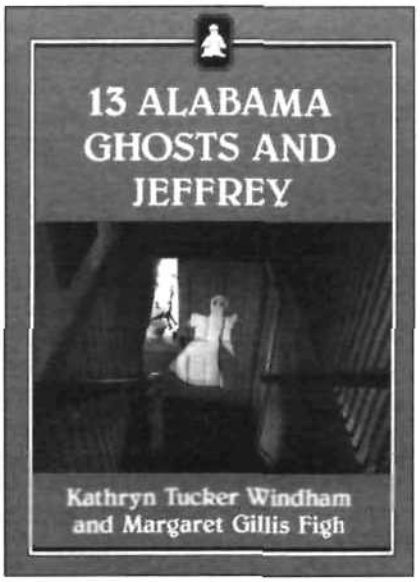
The law apparently does not provide exemptions for those who claim psychic powers. If an ordinary passenger, while going through airport security or boarding an aircraft, suggested to security personnel that there was a bomb on board (with enough surety to trigger a full-scale search), he or she would likely have been arrested. Apparently it is the Department of Homeland Security's policy that any "psychic's" odd feeling, whim, or premonition will be sufficient to delay or cancel any flight, while the agency will protect him or her from prosecution, accountability, or even identification.

—Benjamin Radford

Benjamin Radford is managing editor of the SKEPTICAL INQUIRER.

Jeffrey, the Southern Sham: Ghost Photo Consultant Nonexistent

Jeffrey is very well known in the South. He has "introduced" multitudes of ghosts to the southern reader through the numerous books written by K.T. Windham. Author Windham always gives Jeffrey top billing in the different manuscripts. But how and where did Jeffrey originate?



His entry into the southern mind was the result of a crude hoax. One first reads about Jeffrey in the "foreword" section of *13 Alabama Ghosts and Jeffrey*. This manuscript was written by Windham and M.G. Figh and was originally published in the 1960s by Strode Publishers of Huntsville, Alabama. Jeffrey was presented as fact, not fiction, by Strode.

The crux of the Jeffrey ghost is the infamous photograph in which a shadowy figure is seen behind Nikki Davis, a

staff photographer for the *Selma Times-Journal*, when the picture was taken. The Strode Publishers wrote in *13 Alabama Ghosts and Jeffrey* that they were skeptical about ghosts until they viewed the photographs of Jeffrey. They supposedly then asked and received permission to give the photograph the "third degree." This is shameful, considering the facts. Wrote the publishers:

> We began by requesting a reputable art consultant, the Ludwig Studios of Cherry Hill, New Jersey, to give the photograph a controlled and detailed study. Ludwig's photography staff spent several months analyzing Jeffrey by means of technical tests. They performed a series of actual experiments to see if darkroom shenanigans in the first place could have transposed Jeffrey's photograph onto the negatives. All to no avail. They could not conjure up an artificial Jeffrey no matter how many photographic tricks they tried. Jeffrey remained not only unsurpassed—he remained unduplicated.

The truth of the matter is, however, that there is no Ludwig Studios in Cherry Hill, New Jersey. There never was a Ludwig Studios in Cherry Hill, New Jersey. And there is no Jeffrey.

The Division of Commercial Recording in New Jersey's Department of State has no record of Ludwig Studios existing as a corporation, a limited partnership, or any variations of that name. Commercial Recording suggested checking with the Camden County Clerk (Cherry Hill is in Camden County) to see if Ludwig Studios was registered as a sole proprietorship, general partnership, or under a trade name. The Camden County clerk said there is no record of Ludwig Studios. Rita Lattanzi, the deputy clerk, said Ludwig Studios may have existed with no formal record because state laws were not as strict in the 1960s. Further research led to the Chamber of Commerce in Cherry Hill. Chamber employees said Ludwig Studios never existed. Cherry Hill had a population of only 15,000 in the late 1960s and an older employee at the Chamber had no memory of Ludwig Studios. Chamber staff also checked the Cherry Hill phone book back through 1958. No listing for Ludwig Studios.

Apparently, the "reputable art consultant" of Strode Publishers never existed. Certainly a reputable company would have had a telephone. One could also ask why an art consultant in New Jersey was chosen to analyze a photograph of a ghost in Alabama. Were there no reputable photography and art consultants in Alabama?

Again, a crude hoax was perpetrated by the original publishers—a sham that has created a mindset in the South that is continually inflamed by Jeffrey and his introductions.

—Mark W. Durm

Mark Durm is in the Behavioral Sciences Department, Athens State University, Athens, Alabama.

Photographs Shown to Trigger False Memories

A report titled "True Photographs and False Memories," to be published in the journal *Psychological Science*, presents evidence that photographs can trigger or aid in the creation of false memories. This may have repercussions for the clinical practice of using old photographs to "re-establish" repressed memories of childhood events such as sexual abuse or other trauma. The team that conducted the study was led by D. Stephen Lindsay of the University of Victoria (British Columbia, Canada), who was assisted by Lisa Hagen and J. Don Read of that same institution and Kimberley A. Wade and Maryanne Garry of Victoria University of Wellington (New Zealand).

The study's subjects—college undergraduates enrolled in an introductory psychology course—were each presented with three narratives, two true and one false, that supposedly described events from their childhoods. The true stories were obtained from the subjects' parents; the third, involving the subject having put a toy called Slime® into a teacher's desk drawer in the first or second grade, was inserted by the researchers as a potential false memory. The students were split into two groups by random assignment: the members of one group were shown photographs from the appropriate years of elementary school, while those of the other were not.

The research procedure was conducted over two sessions. During the first, the subjects were told the stories, true and false, and those who were shown photographs saw them at this point. Then the subjects were asked to spend the next week before the second meeting recalling as many details as they could about the events that had been described; they were given written texts of the narratives and copies of the photographs to take with them. While the difference in recollection of the so-called pseudoevent between the photo and no-photo groups was statistically insignificant for the first session, that same measure for the second session was more dramatic. This indicates that the presence of the photographs may reinforce the construction of the false memory. The subjects commonly expressed surprise when informed that the pseudoevent had, in fact, never occurred.

"Our central finding," the researchers report, "is that supplementing the other suggestive influences with a photo associated with (but not depicting) the suggested pseudoevent doubled the rate of false-memory reports, yielding a substantially higher rate of false memory reports than any prior study."

More research is needed: there is, of course, significant difference between relatively harmless events like childhood pranks and those which leave genuine psychological scars, but, as the report says, ". . . there is little reason to doubt that the mechanisms involved in our effect can contribute to other sorts of false memories, and therefore our results warrant concern about the riskiness of encouraging clients to review old photo albums during attempts to 'recover' suspected but not remembered histories of childhood sexual abuse."

—David Park Musella □

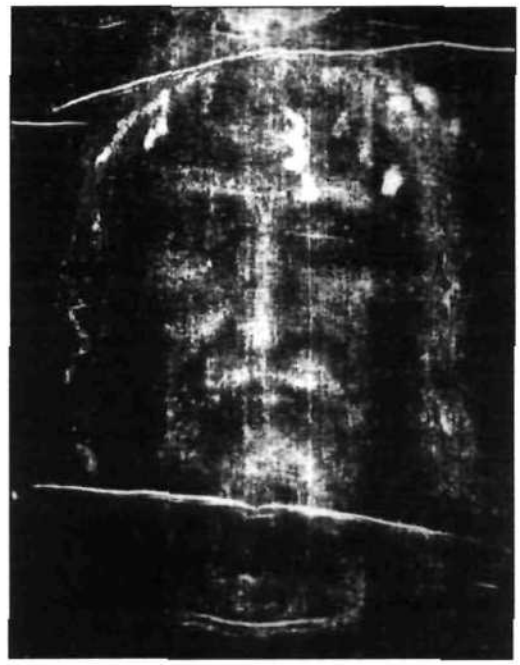
PBS 'Secrets of the Dead' Buries the Truth about Turin Shroud

JOE NICKELL

Although science and scholarship have demonstrated that the Shroud of Turin is a medieval fake, die-hard shroud enthusiasts continue to claim otherwise. Just in time for Easter 2004 viewing, a PBS television documentary that aired Wednesday, April 7, gave them a forum to state their conviction that the image on the cloth is a first-century picture—miraculous or otherwise—of Jesus' crucified body.

As part of the *Secrets of the Dead* series, the "Shroud of Christ?" presentation was a study in pseudoscience, faulty logic, and the suppression of historical facts. Omitted were mention of the contrary gospel evidence, the reported forger's confession, and the microanalytical analyses that showed the "blood" and "body" images were rendered in tempera paint. Unsubstantiated claims were presented as fact, and the radiocarbon results—which dated the cloth to the time of the forger's confession—were treated in straw-man fashion: presented as virtually the sole impediment to authenticity.

Knowledgeable skeptics were avoided.



Instead, viewers were subjected to the astonishingly absurd notion of an art historian named Nicholas Allen that the image was "the world's first photograph." (The technique was supposedly invented to make a fake shroud and then conveniently lost for subsequent centuries!)

The intellectual incompetence or outright dishonesty of the show's producers is matched only by that of the PBS executives who foisted it on a credulous Easter-season audience. The following facts are an antidote to that scientific and historical revisionism:

- The shroud contradicts the Gospel of John, which describes multiple cloths (including a separate "napkin" over the face), as well as "an hundred pound weight" of burial spices—not a trace of which appears on the cloth.
- No examples of the shroud linen's complex herringbone twill weave date from the first century, when burial cloths tended to be of plain weave in any case.
- The shroud has no known history prior to the mid-fourteenth century, when it turned up in the possession of a man who never explained how he had obtained the most holy relic in Christendom.
- The earliest written record of the shroud is a bishop's report to Pope Clement VII, dated 1389, stating that it originated as part of a faith-healing scheme, with "pretended miracles" being staged to defraud credulous pilgrims.
- The bishop's report also stated that a predecessor had "discovered the *fraud* and how the said cloth had been *cunningly painted*, the truth being attested by *the artist who had painted it*" (emphasis added).
- Although, as St. Augustine lamented in the fourth century, Jesus' appearance was completely unknown, the

Joe Nickell, Ph.D., is CSICOP's Senior Research Fellow and an expert on the Shroud of Turin. He is author of Inquest on the Shroud of Turin *(Prometheus 1983, 1998) and numerous articles, including "Blooming 'Shroud' Claims" (*Skeptical Inquirer, *Nov./Dec. 1999) and "Pollens on the 'Shroud': A Study in Deception" (*Skeptical Inquirer, *Summer 1994).*

shroud image follows the conventional artistic likeness.

• The physique is unnaturally elongated (like figures in Gothic art), and there is a lack of wraparound distortions that would be expected if the cloth had enclosed an actual three-dimensional object like a human body. The hair hangs as for a standing, rather than reclining figure, and the imprint of a bloody foot is incompatible with the outstretched leg to which it belongs.

• The alleged blood stains are unnaturally picture-like. Instead of matting the hair, for instance, they run in rivulets on the outside of the locks. Also, dried "blood" (as on the arms) has been implausibly transferred to the cloth. The blood remains bright red, unlike genuine blood that blackens with age.

• In 1973, internationally known forensic serologists subjected the "blood" to a battery of tests—for chemical properties, species, blood grouping, etc. The substance lacked the properties of blood, instead containing suspicious, reddish granules.

• Subsequently, the distinguished microanalyst Walter McCrone identified the "blood" as red ocher and vermilion tempera paint and concluded that the entire image had been painted.

• In 1988, the shroud cloth was radiocarbon dated by three different laboratories (at Zurich, Oxford, and the University of Arizona). The results were in close agreement and yield a date range of A.D. 1260–1390, about the time of the reported forger's confession (ca. A.D. 1355).

Defenders of the shroud's authenticity have rationalizations for each damning piece of evidence. For example, they assert that microbial contamination might have altered the radiocarbon date, although for an error of thirteen centuries, there would have to be twice as much contamination by weight as the cloth itself! Beginning with the desired answer, they work backward to the evidence, picking and choosing and—all too often—engaging in pseudoscience.

In contrast, the scientific approach allows the preponderance of evidence to lead to a conclusion: the shroud is the work of a medieval artisan. The various pieces of the puzzle effectively interlock and corroborate each other. In the words of Catholic historian Ulysse Chevalier, who brought to light the documentary evidence of the Shroud's medieval origin, "The history of the shroud constitutes a protracted violation of the two virtues so often commended by our holy books, justice and truth."

The intellectual incompetence or outright dishonesty of the show's producers is matched only by that of the PBS executives who foisted it on a credulous Easter-season audience.

For more information on the Shroud of Turin and other allegedly miraculous images of Jesus of Nazareth, visit the new "Miraculous Self-Portraits of Jesus?" Feature Exhibit on the Skeptiseum (www.skeptiseum.org). □

A Once-in-a-Lifetime Experience—
Cruise the Caribbean with Secular Humanists and Skeptics!

December 11–18, 2004

Onboard Holland America's ***Zaandam*** out of Pt. Canaveral, Florida, visiting the British Virgin Islands, U.S. Virgin Islands, and the Bahamas.

There'll be guest lecturers and surprises galore. Enjoy a grand vacation in grand company, while you support the Center for Inquiry. For itinerary, pricing, and reservations contact Center for Inquiry–*Florida* at 800-398-7571 or e-mail cruise@cfiflorida.org.

cfi CENTER FOR INQUIRY *Florida*

New Future Fund

CENTER FOR INQUIRY
International

Our Mission: **To promote and defend reason, science, and freedom of inquiry in all areas of human endeavor.**

Outpacing its origins as a dissenting publisher, today's Center for Inquiry (CFI) movement has emerged as an **educational resource, think tank, and advocacy organization.** We have a bold plan to advance *critical thinking, freedom of inquiry,* and the *scientific outlook* through *research, publishing, education, advocacy,* and *social services.*

REACH OUT TO A NEW FUTURE!

As before, CFI:

- Supports the Council for Secular Humanism and the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP).
- Operates the world's premier freethought and skeptical libraries.
- Offers distinguished adult education programs through the Center for Inquiry Institute.

But, the Center needs to reach out in new ways ... tackling new problems, exerting influence.

That's why the Center for Inquiry's **New Future Fund** seeks millions of new dollars for program needs, capital expansion, and endowment.

Your New Future Fund Gift Can Support:

Independent Publications. Besides aiding *Free Inquiry* and *Skeptical Inquirer,* CFI publishes the independent *American Rationalist; two important journals, The Scientific Review of Alternative Medicine* and *The Scientific Review of Mental Health Practice;* and skeptical magazines serving the UK and the Spanish-speaking world.

Branch Centers Across the United States and the World

Amherst, New York (HQ): We increased library space 30 percent and are beginning plans for a major new addition.

Hollywood, California: Renovation of our 9,000-square-foot Center for Inquiry – *West* is complete. There, a new National Media Center will reach out to — and critically examine — the entertainment media. The 99-seat Steve Allen Theater will also serve as a television production facility.

New York, New York: Our Center for Inquiry – *Metro New York* in Rockefeller Center reaches out to the nation's financial, intellectual, and news media centers, while facilitating local activities throughout the metro area.

Tampa Bay, Florida: Center for Inquiry – *Florida* offers a stimulating menu of programs and activities while it searches for permanent quarters.

International Centers: in a bold program expansion, new Centers for Inquiry now operate in Russia, Mexico, Peru, Nigeria, Germany, France, and Nepal, doing vital work in defense of the open society. We plan further expansion into countries with little or no exposure to humanism.

Center for Inquiry-*International,* Amherst, NY

Center for Inquiry-*West,* Los Angeles, CA

Center for Inquiry-*Metro NY,* at Rockefeller Center

Center for Inquiry-*Florida, opening soon in Tampa*

Please complete and mail the enclosed card for further information.

Or contact:
Center for Inquiry – *International*
PO Box 741, Amherst NY 14226-0741
(716)636-4869, ext. 311
e-mail: development@centerforinquiry.net
http://www.centerforinquiry.net

This is just part of our plans. The New Future Fund will make CFI more self-sufficient and lessen dependence on publishing revenues. Please support our efforts. We seek gifts of **cash, multiyear pledges, negotiable securities, paid-up insurance policies,** and **other assets.** Our Development Department can assist you in confidence to design a planned giving program that can benefit yourself and your heirs while supporting the Center's growth.

Mythical Mexico

The northernmost country of Latin America, Estados Unidos Mexicanos (United States of Mexico) is rich in prehistoric and historic culture, a land of legend, lore, and struggle.

Home to various indigenous peoples from ca. 2600 B.C., Mexico was seized by the Spanish in 1519–1521 when Hernán Cortez conquered the Aztec Empire. The population was subsequently decimated by Old World diseases. Spanish Catholic culture was established, and the country was exploited for its natural resources. Following a struggle for independence that began in 1810, Spanish rule ceased in 1821.

The nineteenth and early twentieth centuries saw a series of revolts, revolutions, and wars, among the consequences being the loss of Texas, New Mexico, and California to the U.S. A new constitution in 1917 helped ensure democracy, although not without continued economic crises and political strife (*Webster's* 1997).

In the fall of 2003, following a CSICOP conference in Albuquerque, New Mexico, colleague Vaughn Rees and I made an investigative trip across northern Mexico from Ciudad Juárez to Tijuana. We were able to witness the ubiquitous nature of the "miraculous" Image of Guadalupe, experience the cultural festivity known as the Day of the Dead, examine some colorful techniques of fortunetelling, and investigate (undercover) the availability of the notorious cancer "cure" called Laetrile. Here is a brief look at some of what we found.

Image of Guadalupe

Mexico's most revered pictorial is the Image of Guadalupe. Although the sixteenth-century original is displayed in a Mexico City church, where some ten million pilgrims bow down before it annually, copies of the "miraculous" picture are found nearly everywhere.

The Image is a depiction of Mary, the Virgin Mother of Christ in the New Testament. According to a post-conquest legend, the Virgin appeared in December 1531 to an Aztec peasant, Juan Diego, upon whose cloak she miraculously imprinted her portrait. This was intended as a "sign" to a skeptical bishop so he would build a church to honor her. Not coincidentally, the shrine was in front of the site where the Aztecs had had a temple dedicated to their own virgin goddess, Tonantzin (Smith 1983). Thus the Catholic tradition was grafted onto the native one, a process folklorists call *syncretism.*

Venerated for centuries as a miraculous bestowal, the Image is actually a work of art. Except for the Virgin's dark complexion (part of the syncretism) it is a traditional portrait of Mary, clearly derived from earlier Spanish depictions. During a formal investigation of the cloth in 1556 it was stated that the figure was "painted yesteryear by an Indian," specifically "the Indian painter Marcos." This was probably Marcos Cipac de Aquino, an Aztec artist who was active at the time of the Image's appearance. Some new scholarship suggests that the pious legend of Mary's appearance to Juan Diego—whose very existence is doubted by several Catholic scholars—may date from the following century.

The image shows unmistakable evidence of painting. Infrared photos reveal that the hands were modified, and close-up photography demonstrates that in highlight areas the cloth's weave is obscured, consistent with the application of paint. There is even flaking of the image along a seam. Forensic analyst John F. Fischer and I reported additional evidence of artistry from our "folkloristic and iconographic investigation" of the Guadalupan Image (Nickell and Fischer 1985).

In 2002 our findings were confirmed when the results of an earlier, secret study were reported. The cloth had been examined in 1982 by art restoration expert José Sol Rosales. His stereomicroscopic analysis revealed that the Image had been prepared with a brush coat of white primer (calcium sulfate) and the image then rendered in a water-based paint containing common pigments (El Vaticano 2002).

Nevertheless, the probably fictitious "Juan Diego" was canonized a saint of the Roman Catholic church in 2002, and veneration of the Guadalupan Image continued unabated. A postage-stamp-size swatch of the canvas was even sent on a national tour to promote reverence for relics. It was "said to have been worn by a saint and touched by the mother of God" (Gorski 2003).

Joe Nickell is a former private detective and author of numerous investigative books including Crime Science *and* Psychic Sleuths.

Figure 1. Image of Guadalupe as a folk painting on roadside rock outcropping. (Photo by Joe Nickell)

Copies of the Image have always been abundant—to say the least. Reported one source (Demarest and Taylor 1956, 2):

> You will find every imaginable representation of her in the churches. . . . You may find her outlined in neon as part of a downtown spectacular, chalked into a hillside, on a throwaway advertising a mouthwash, pricked out in flowers in public parks; clowns and hucksters will distribute booklets about her as a preliminary to hawking patent medicines. . . . Bullfighters have her image woven into their parade capes; she is a popular tattoo subject; almost everyone wears her medal.

Vaughn Rees and I soon confirmed the ubiquity of the Image. In Ciudad Juárez a major attraction is the old mission church of *Nuestra Señora de Guadalupe* ("Our Lady of Guadalupe"), completed in 1668. A thin, elderly gentleman dressed in a suit and fedora—famed local guide, Angel—graciously escorted us around. In addition to some more recent features (including bullet holes dating from the Mexican revolution), he pointed out a framed painting of the Image of Guadalupe—a reproduction of the *tilma* (or cloak) on which the Virgin legendarily imprinted her picture. Angel said it was the oldest such reproduction in Mexico. Nearby was also an imaginative portrait of Juan Diego.

Leaving Juárez, we discovered that many of the little roadside shrines along the otherwise barren route to Mexicali feature the Image. In one, it took the form of a painted plaster figurine; in another, a framed print; in still another, a folk-art mural. Many shrines had at least an incidental Image, depicted on a commercial votive candle. One distinctive site (figure 1) featured *La Virgen de Guadalupe* colorfully painted upon a rock outcropping.

Elsewhere, we constantly encountered the Image. In Tijuana it adorned the front of a cathedral, behind whose altar was another representation, while one stained-glass window portrayed Our Lady of Guadalupe appearing to Juan Diego. We discovered the Image in the ceramic tile of a building, again as the dominant feature of a store shrine, and even as part of a scene painted on the back of a water truck.

The Image endures, however, not as an authentic "relic" as many believe but as a symbol of syncretism and an example of superstition's resistance to historical and scientific evidence.

The Day of the Dead

In ancient Mesoamerica, the *indigenistas* used music and dance in festivities presided over by the Aztec deities *Mictlantecuhtli* and *Mictecacihuatl* ("Lord and Lady of the Dead"). These ceremonies celebrated spirits of the deceased (*Huey* n.d.).

The indigenous mythology clashed with Catholic teachings about heaven and hell, with the result that native customs were suppressed and overlaid with Christian ones—another instance of syncretism. Spanish priests moved the time of the festivities to coincide with All Hallows. Thus Mexicans now celebrate November 1 and 2 as, respectively, *Día de Todos Santos* ("All Saints Day") and *Día de Muertos* ("Day of the Dead") (Andrade 2002, 9, 22; Salvador 2001). Concludes one writer, ". . . [R]emember the dead they still do, and the modern festivity is characterized by the traditional Mexican blend of ancient aboriginal and introduced Christian features" (Salvador 2001).

Therefore, despite some current seepage of customs from north of the border, the Day of the Dead is not Mexico's Halloween. Whereas the All Hallows concept stems from medieval European

notions of death, involving punishment and gratuitously sinister imagery, the Day of the Dead incorporates more playful and especially celebratory features. People honor their deceased loved ones and await some signal or manifestation from them (Joseph 2003).

Customs (including even the exact dates of observance) vary from region to region, but cemeteries as well as many Mexican homes are typically readied for the occasion. At noon on the first day, the home's patio may be swept and the house decorated with white flowers. Offerings are set out for the spirits of deceased children, consisting of small jugs of cream, together with fruit, candies, and toys. The child spirits are believed to join in the celebration and to consume "the essence" of the offerings. The next day, the home is prepared anew for the spirits of deceased adults who may be honored with sugar skulls bearing their names. Other offerings may include tortillas, cigarettes, tequila, fruit, and *pan de muerto* ("bread of death"), all placed on the home's dinner table (*Huey* n.d.).

In Mexicali, on November 1, Vaughn and I stopped at a large cemetery where we watched the locals sprucing up and decorating their family plots. They washed gravestones, swept graves, painted fences, placed flowers, fastened crepe streamers, and more—all as part of an expressly festive occasion. Music blared, and a mariachi band roved in search of pesos. Vendors were in profusion, selling everything from brooms and flowers to burritos, soft drinks, and cotton candy. It was part picnic, part religious observance, and part family reunion—intended for the living *and* the dead.

The following day we were in Tijuana—Mexico's fourth largest city—for the Day of the Dead festivities, held in El Centro (downtown). A Mexica-Aztec Warrior Dance Group entertained with their expressive folk dancing as part of *Huey Mikailhuitl* ("Great Celebration of the Dead" *Huey* n.d.).

Services were being held in the cathedral while, outside, vendors sold devotional and other items. Along the streets, shop owners had their Day-of-the-Dead wares prominently displayed. Among these were comic, costumed, little skeletal figures, as well as articulated skeletons of wood and string, and the popular confectionary skulls, formed of hard sugar with added touches of color (figure 2).

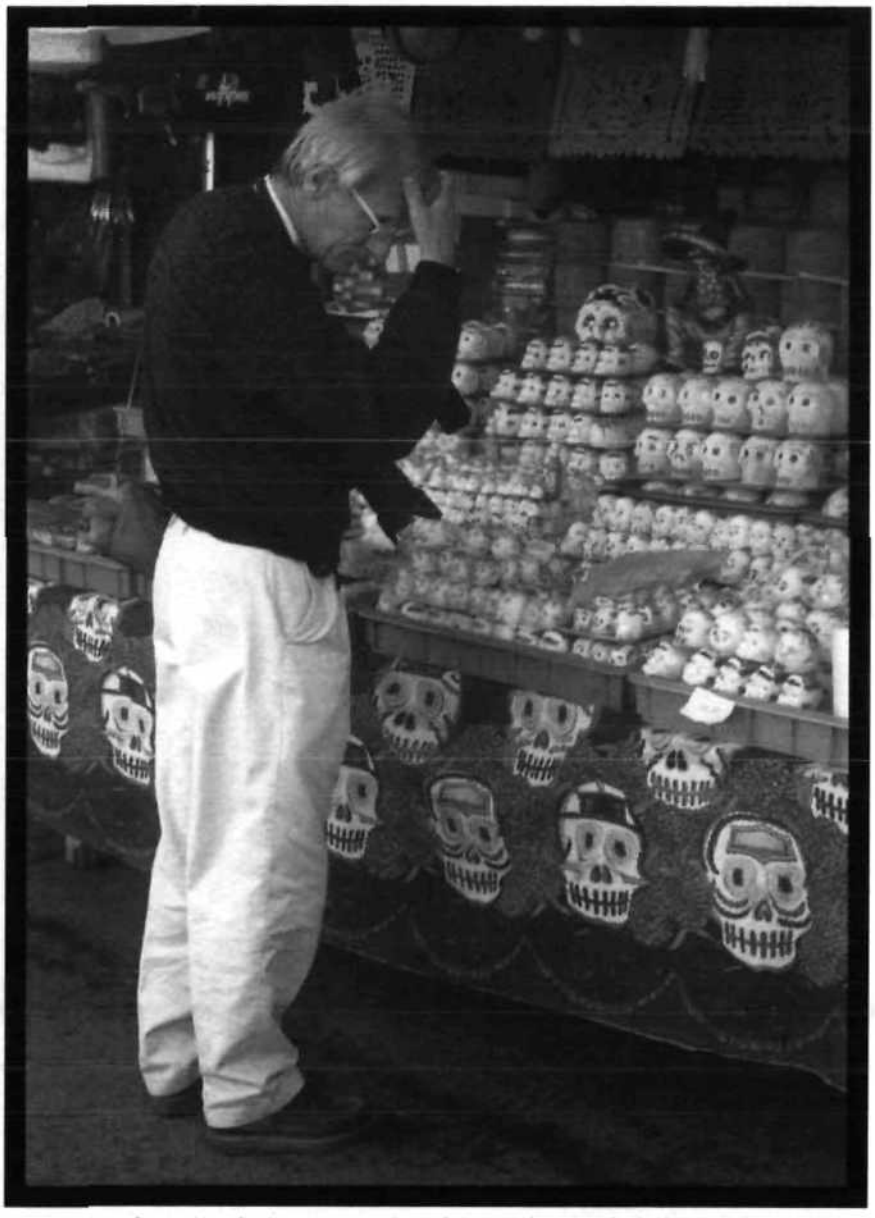


Figure 2. Investigator Vaughn Rees surveys "Day of the Dead" sugar skulls. (Photo by Joe Nickell)

Despite its superstitious basis, the Day of the Dead is a colorful and enjoyable occasion—as well as a poignant one—a time to remember those no longer among the living.

Fortunetelling

In Ciudad Juárez I was able to have my fortune told by—a canary! The sidewalk vendor wore a shirt emblazoned with Tarot cards. To prognosticate, he picked up a pinch of bird seed, then let his charge out of its cage, whereupon it plucked two folded paper slips from a rack. The little bird waited for its reward, then dutifully hopped back into its cage, and I paid up: five pesos for each fortune slip and five dollars for the privilege of taking a photograph.

From another prescient canary in Tijuana, I obtained two more fortune slips, together offering a welter of predictions and advice. One of the four slips was in English:

> You shall soon receive good news in the mail about the matter that so concerns you. But before this, some one shall rather mysteriously get in touch with you. I can tell you no more as I cannot read your mind.

I was intrigued by the latter admission. As to the fortunetellings, I have tried to assess them fairly. Unfortunately, the events that seem best to match the vague

predictions *had already occurred* by the time I received the slips! What birdbrain prognostications!

Also in Tijuana, on the Day of the Dead, Vaughn and I visited a professional fortuneteller whose sign offered *"Lectura de las cartas y Palma de la Mano"* (i.e., card readings and palmistry). His place of business was one flight up. "Sir Omar" gave me his card which stated that he was *"Maestro en Ciencias Occultas"* (Master of Occult Sciences) who offered *"Soluciona tus Problemas"* (Solutions to Your Problems). An outgoing man, he told us he had worked in the same place for twenty-eight years. His cards looked nearly that old. (I was later able to purchase a similar set, approximately the size of a regular deck but with Tarot-like suits of swords, cups, wands, and coins.) He agreed to do my reading in his struggling English for one hundred pesos (about ten dollars).

Figure 3. Tijuana cartomancer (right) reads fortune of investigator Joe Nickell. (Photo by Vaughn Rees)

Getting into my undercover role for the next day's investigation of quack cancer treatments, I falsely told the cartomancer that my reason for coming was that I had recently been diagnosed with terminal cancer. My persona was that of a frightened man who could think of little else.

Sir Omar had me cut the cards into three stacks, following which he began the reading (figure 3). He told me that a black-magic curse had been placed on me in 1978 by a "dark woman," but that that had now been lifted. (I regarded this as utter nonsense.) He stated that my health was in the hands of the medical profession but that he foresaw my having a long future. (He was simply telling me what he thought I wanted to hear.) Everything—money, and even love from a much younger woman (twenty-one years younger, he specified)—was to be mine in abundance. (He was obviously just continuing to dispense happy possibilities, which, after all, cost him nothing.) Then he asserted that someone would try to borrow a sum of $7,000 from me but that I should decline the request. (Months later that had still not occurred.)

Sir Omar ended by allowing me three questions, but I insisted that nothing mattered to me beyond my health. He repeated what he had said earlier, indicating that I would pull through the difficulty and live long. He wrote his phone number on the back of his card and suggested I call him in several months.

The alleged clairvoyant, in my opinion, merely sold optimism, depending for any success on what skeptics call "the Barnum effect." Named for showman P.T. Barnum, who strove to provide something for everyone, this is the tendency of people to respond to a vague, generalized statement by trying to fit it to their own situation (French et al. 1991). The soothsayer may also have hoped that his optimistic statements and cautionary foretellings would function as self-fulfilling prophecies, prompting the sitter to help bring about that which he expects to occur. The bottom line is that he failed to divine anything that was truly enlightening, completely missed important things that were actually occurring in my life, and was apparently oblivious to the actual state of my health or the true nature of my visit. He did succeed in collecting one hundred pesos.

Laetrile

I continued my undercover role the following day as Vaughn and I searched Tijuana for sources of Laetrile, a notorious cancer treatment outlawed in the U.S.

According to Quackwatch (Wilson 2004)—an online source of information on doubtful medical treatments—the story of Laetrile, is one of quackery, crime, and death. Laetrile, a trade name, is chemically related to amygdalin, a substance (a cyanogenic glycoside) that occurs naturally in the pits of apricots and certain other fruits. Most Laetrile proponents use the terms amygdalin and Laetrile interchangeably. The so-called "father" of Laetrile, "Doctor" Ernst T. Krebs, Jr., was the son of a physician who promoted various alleged cures for cancer and other serious illnesses. The younger Krebs had only a B.A. and a "Doctor of Science" degree from a now-defunct Bible college.

The Krebses claimed cancer tissues contained an abundance of an enzyme that caused amygdalin to release cyanide, which in turn destroyed cancer cells. (Noncancerous tissues were supposedly protected by another, cyanide-neutralizing enzyme.) Later, when enforcement agencies sought to ban the drug, the Krebses claimed amygdalin was a vitamin—"B_{17}"—and asserted that cancer resulted from a deficiency of that vitamin. These claims have been discredited (Wilson 2004).

Repeated studies—including that of the Cancer Advisory Council in 1962–1963—found that Laetrile had no value in treating cancer. At a 1977 U.S. Senate subcommittee hearing that he chaired, Senator Edward Kennedy (D-Mass.) concluded that Laetrile's promoters were "slick salesmen who would offer a false sense of hope" (Wilson 2004).

Publicity about Laetrile sent desperate cancer victims to Mexico, including, in 1980, Hollywood actor Steve McQueen. He gave a glowing testimonial at the beginning of his treatment, but he soon died. Although the Laetrile movement reached its peak in the 1970s, the drug continues to be sold through toll-free telephone numbers, Internet sites, shell companies, and other means (Wilson 2004). An organization called the Cancer Control Society, which has a post office box in Modesto, California, offers bus tours of cancer treatment clinics in Tijuana, including those offering Laetrile (Cancer 2004).

Vaughn Rees and I sought to learn the extent of Laetrile availability in Tijuana. On the Day of the Dead, we scouted out several places—including various herb shops and pharmacies—looking for the drug. However, none of the people we questioned seemed to know anything about it. Inquiry at an information booth yielded the phone number of one hospital that offered "alternative" treatments, but a call revealed they did not offer Laetrile. A visit to another was likewise negative (although it offered homeopathic treatments). However, a receptionist was willing to provide us with the names and addresses of clinics that do offer Laetrile.

We were able to visit one of these, a large modern, respectable-looking facility called the Oasis of Hope Hospital. I told a receptionist that I had been diagnosed with prostate cancer and that my doctor offered no hope. "Frankly," I said, putting a tremor in my voice, "I'm scared." (In fact, a few months earlier I had required a prostate biopsy, which proved negative. Later, I briefly discussed this planned undercover role with an oncologist.)

The receptionist nodded, businesslike, and indicated for me to have a seat and wait while she summoned someone to talk with me. Vaughn hovered around, in the character of someone assisting a sick friend. Soon, a young woman from "Customer Service" (as her card read) sat down with me, and I repeated my story in some more detail. I made it clear I was not there to be admitted but instead had only made a side jaunt while visiting my California friend to check out my options. I said I had heard about something called Laetrile but I deliberately fumbled with the pronunciation.

I was given a form to fill out so that my name would be on file—"no obligation," I was promised. I listed my occupation as "retired." I then received a packet of materials. One brochure, promoting the Oasis-operated "Contreras Cancer Care Center" (n.d.), admitted that

> *The programs are eclectic and often include:*
> - Laetrile, Enzymes, Mega-doses of Vitamins
> - Regenerating Agents
> - Immune Modulating Agents
> - Prayer Therapy
> - Shark Cartilage (100% Pure)
> - Antioxidants
> - Hormone Therapy
> - O-Zone [*sic*]

Another brochure, an "Oasis of Hope Activity Schedule" (n.d.), listed such offerings as "Laetrile use and care/Important to attend" and a video by Dr. Ernesto Contreras titled "What the Bible Says about Disease."

Dr. Ernesto Contreras, Sr., a former pathologist with the Mexican Army, was an early Laetrile promoter who employed translators to accommodate his numerous American patients. Business was so good in 1970 that he constructed the facility since named Oasis Hospital (Wilson 2004). A color brochure pictures Contreras holding hands with apparent patients, eyes closed and heads bowed in prayer (Contreras n.d.).

After returning home, I received from Oasis Hospital in San Ysidro, California, additional materials including a video with the message, "It is no wonder why more than 40,000 Americans have sought refuge at the Oasis of Hope Hospital." States the narrator, "Although conventional chemotherapy and radiation treatments are available, the heart of the program is alternative therapy." This features "metabolic therapy" which utilizes "a steady diet of organic foods and mega-doses of vitamins" including Laetrile. Prayer is encouraged. According to Dr. Francisco Contreras (whose voice is accompanied by inspirational music), "In this hospital the medical director is Jesus Christ, and *that* makes a difference."

Not only should this appeal make non-Christians feel insulted, but the attempt to imply Jesus' endorsement of something as dubious as Laetrile should offend Christians as well. *Everyone* should beware of the snake-oil approach.

Acknowledgments

In addition to those mentioned in the text, I am grateful to Andrew A. Skolnick, executive director of the Commission for Scientific and Mental Health, and Dr. Wallace Sampson, editor of *The Scientific Review of Alternative Medicine.*

References

Andrade, Mary J. 2002. Day of the Dead in Mexico. San Jose, Calif.: *La Oferta* Review.

Cancer Control Society. 2004. Available at www.cancercontrolsociety.com. Accessed March 16.

Contreras Cancer Care Center. N.d. (current 2003). Tijuana, Mexico. Brochure of Oasis of Hope Hospital.

Demarest, Donald, and Coley Taylor, eds. 1956. N.p.: Academy Guild Press.

El Vaticano. 2002. *Proceso,* May 19, 29–30.

French, Christopher C., et al. 1991. Belief in astrology: A test of the Barnum effect. SKEPTICAL INQUIRER 15(2), Winter: 166–172.

Gorski, Eric. 2003. Saint's cloak to warm faithful. *Denver Post,* May 27. Available at www.denverpost.com.

Huey Mikailhuitl (Great celebration of the dead). N.d. [2003]. Brochure of Mexica-Aztec Warrior Dance Group.

Joseph, Dana. 2003. Life in death. *Southwest Airlines Spirit,* October, 87–90.

Nickell, Joe, and John F. Fischer. 1985. The Image of Guadalupe: A folkloristic and iconographic investigation. SKEPTICAL INQUIRER 9(3), Spring: 243–255.

Oasis of Hope Activity Schedule. N.d. [2003]. Tijuana, Mexico. Brochure of Oasis of Hope Hospital.

Salvador, Ricardo J. 2001. What do Mexicans celebrate on the "Day of the Dead?" www.public.iastate.edu/rjsalvad/scmfaq/muertos.html. Accessed May 14.

Smith, Jody Brant. 1983. *The Image of Guadalupe.* Garden City, N.Y.: Doubleday.

Webster's New Universal Encyclopedia. 1997. New York: Barnes & Noble, 760–761.

Wilson, Benjamin. 2004. The rise and fall of Laetrile. Available at www.quackwatch.org/01QuackeryRelatedTopics/Cancer/laetrile.html. Accessed March 15.

Skepticism, a Philosophical Viewpoint

Skepticism has a long tradition in philosophy, going back to the ancient Greeks, but that is not what this column is about. Rather, I wish to comment on what sort of help, if any, philosophy can give to empirical skepticism—that is, to the sort of skepticism that readers of SKEPTICAL INQUIRER are interested in. But what can an armchair activity like philosophizing possibly contribute to the field investigations of, say, Joe Nickell? The British magazine *Philosophy Now* (July/August 2003) has recently published a special issue featuring several articles that may help us clarify the connection.

The pseudoscientific phenomenon taken up by Joe Fearn in that issue of *Philosophy Now* is out-of-body experiences. Readers of SI are familiar with this sort of claim, and with what skeptics do to investigate (and, usually, debunk) them in the field. So what does a philosopher have to add to the debate?

Consider a typical claim of out-of-body experience and how an empirical skeptic may go about debunking it. Say a person is convinced that he has temporarily left his body during a surgical operation, and supplies descriptions of the room as seen from above, of conversations among the doctors, and even of himself laying on the operating table. An empirically minded skeptic might then begin by attempting to independently verify the details recounted by the subject. The skeptic could, for example, compare the position and use of objects during the operation with details given by the patient; ask the doctors what exactly they said during the operation and when they said it; and look into the possibility of non-paranormal explanations for the experience itself, such as the effects on the brain of the drugs used to induce anesthesia.

This is all well and good, but notice what the empirical skeptic has done: she has *assumed* that there was something coherent to be explained, immediately focusing on the details of the claim in order to discriminate between the possibility of a real physical phenomenon versus the likelihood of an entirely mental experience. Not so the philosopher. Being more interested in the meaning of concepts and experiences, a philosopher would begin at the very foundations of the alleged paranormal phenomenon.

Scientists are notoriously uninterested in "conceptual" discussions and prefer to "get the data" and "make progress." But surely one has to know where to look before being able to get meaningful results.

For example, a philosopher would want to know what it can possibly mean to see oneself from above. What sort of sensorial device would the subject use during such an experience? Obviously not the eyes, since these are presumably still attached to his physical self. But then what? And, since the patient obviously wasn't using his eyes, why could he not "see" at 360 degrees? How is it

Massimo Pigliucci is professor of evolutionary biology at SUNY–Stony Brook on Long Island and author of Denying Evolution: Creationism, Scientism and the Nature of Science. *His essays can be found at www.rationallyspeaking.org.*

possible that his allegedly out-of-body experience was actually confined to the normal field of view of physically bound human beings? Was the subject perhaps dreaming, given that during dreams one retains the same field of view that one has when awake, even though obviously one is not using his eyes?

The point I'm trying to make is that this example (and a similar one on mind reading in the same issue of *Philosophy Now* by Paul MacDonald) clearly shows the difference between a philosophical and an empirical approach to things: in the first case, one attempts to make sense of the meaning of the terms used to see if the alleged experience is logically coherent; in the second case, one assumes some degree of logical coherence and goes about finding empirically verifiable evidence that either supports or falsifies the experience.

I am not claiming that either approach is superior to the other. On the contrary, it seems to me that they complement each other nicely. As an empirical scientist, I want to find physical clues that can tell me if a certain phenomenon is real or not or if a particular explanation for a given phenomenon is likely to be correct or not. But such a quest takes for granted a series of assumptions about what one is investigating. Occasionally, questioning such assumptions may give the empirical skeptic a different perspective and direct her research toward previously unnoticed avenues.

The same is true for science at large. An example to which I will probably soon return is the current claim in the cognitive sciences that the brain is akin to a computer, and in particular to the kind of computing machine described by mathematician Alan Turing. Steven Pinker, an evolutionary psychologist, has written an ebullient book on this topic entitled *How the Mind Works*, as if we had already established most of what's interesting about thinking and consciousness. Well, we haven't, and philosopher Jerry Fodor has authored a devastating critique of the computational theory of mind, humorously entitled *The Mind Doesn't Work That Way*. Fodor's point is not that computation has nothing to do with how brains do certain things. Instead the philosopher is questioning the scope of the currently available scientific explanation, based on an analysis of *what sort of things* both computation and thinking are.

Scientists are notoriously uninterested in "conceptual" discussions and prefer to "get the data" and "make progress." But surely one has to know where to look before being able to get meaningful results. Serious philosophy can help scientists and skeptics alike to clear up their thinking and perhaps avoid wasting time down some superficially appealing primrose path. □

The Committee for the Scientific Investigation of Claims of the Paranormal is pleased to announce a new skeptical magazine for the Spanish-speaking world.

PENSAR™

The Latin American magazine for science and reason

Highlights from this issue include:

The Nazca Lines • Prehistoric UFOs?
• Subliminal Messages
• Financial Gurus and Economic Pseudoscience
• Skeptical news and information from throughout Latin America

Subscribe Today!

One year (4 issues) $12
Two years (8 issues) $20

To subscribe, send payment to
Pensar c/o CSICOP, P.O. Box 703, Amherst, NY 14226 USA

www.pensar.org

CSICOP

PENSAR
Revista Latinoamericana para la ciencia y la razón
La rebelión del mono
Conozca las falsas predicciones de los gurúes de la economía
Líneas de Nazca
Aterrizando en los laberintos del desierto
Pinturas rupestres
¿OVNIS en el arte prehistórico?
El código Da Vinci
Literatura, historia y conspiraciones
El detector de Dios
Fraude metapsíquico
Peces en Marte

Down with Darwin!

How things can suddenly change for the worse when you least expect it.

Just when one thought that creationism was just a lost war in a country like Italy, where even the Pope spoke against it and in recognition of evolution, there came a cold shower. The Italian government recently announced that evolution was going to be banned from schools. As *Nature* magazine (April 8, 2004) put it: "School curriculum guidelines announced in Italy last month propose that children aged eleven to fourteen do not need to be taught evolutionary theory in biology classes—but they should learn about creationism in religious studies, which are voluntary."

It all started when the minister of education, universities, and research, Letizia Moratti, announced the new teaching programs banning teaching evolutionary theory to young teenagers.

"Pupils aged ten to thirteen are much too young to be confronted with such complicated material," explained Director General Silvio Criscuoli, who was responsible for the teaching plans. Only older pupils who specialized in natural science were to learn about the theory of evolution.

Education Minister Moratti defended the change by explaining that pupils should learn about the origin of species gradually, according to "didactic criteria." That is, they would first learn the biblical version of creation and, only years later, the scientific theory.

In Italy, as in the United States, creation and evolution are becoming political issues. Last February, for example, right-wing party Alleanza Nazionale, one of the parties in Berlusconi's governing coalition, held a series of events to dispute the theory of evolution. In the course of a conference entitled "Teaching Evolution: A Fairytale for the Schools," parliamentarian Pietro Cerullo linked Darwin's theory to leftist thought.

All this has provoked an uproar from the country's top scientists, who wrote an open letter to the minister through the daily *La Repubblica*: "In the new program, established by legislative decree on February 19, 2004, there is no trace of the history of man's evolution nor of the relationship between mankind and other species. Ignoring the theory of evolution is a cultural limitation sacrificing the scientific curiosity of youth. It's unquestionably fair to point out that Darwinism and the theories that derived from it show gaps and unsolved problems, but the link between the past and the present of mankind shouldn't be completely ignored. We urge therefore the Italian Ministry of Education to review the secondary school's programmes and to rectify an oversight which is detrimental to the scientific culture of the new generations."

Fearing the measure will pave the way for creationist teaching, more than 50,000 citizens have signed the petition, leading the minister to revise her position.

"The current school reform does not have rigid programs," said Moratti in a statement. "It features national guidelines that establish the main teaching principles, allowing teachers to adapt the program according to the context and the pupils. It is absolutely false that the ministry banned the teaching of evolution theories in primary and secondary schools. The discussion of Darwin's theories will be included in the education of all students from six to eighteen years, according to gradual teaching criteria."

If this was all a misunderstanding, it is not clear who then convinced all those scientists and those 50,000 worried citizens of the contrary. And it does not explain what has now induced Moratti to appoint a committee specifically to provide guidelines for teaching evolutionary theory at various stages. Chaired by Nobel laureate Rita Levi Montalcini, one of the top scientists who signed the protest petition, and featuring Nobel laureate Carlo Rubbia; both are CICAP (the Italian skeptics group) members.

According to Umberto Veronesi, pioneer in the fight against cancer in Italy and director of the European Institute of Oncology, this result shows that "the 'quiet strength' of rationality can prevail on political positions, conflicting interests, polemics, and even motivated

Massimo Polidoro is an investigator of the paranormal, author, lecturer, and cofounder and head of CICAP, the Italian skeptics group.

beliefs. It shows that science, the supreme form of rationality, can also express social values and can have cultural weight in our country. . . . Today our kids have conquered the opportunity of acquiring from the start that free and authentic scientific spirit that will lead them through life, independently from their specific choices. The teaching of biological evolution right from the early school years, and consequently along with the development of independent thinking, will grow their ability of interpreting the natural world around them. This is the great appeal and value of Darwin's theories."

"Notwithstanding minister Moratti's reassuring words," says Mike McIlwrath, a lawyer in Florence and Director of the U.S.-based National Center for Science Education, "the American experience teaches us that this debate is not an isolated episode, and there is always the risk of this happening again."

Especially now, when many things seem to be changing, and not for the better, in Italy. Most Italians are in fact astonished by recent blatant attempts to limit freedom of thought. Our country, for example, has just been downgraded by Freedom House, a nonprofit, nonpartisan organization founded by Eleanor Roosevelt, from Free to Partly Free due to increased media concentration and subsequent political pressure.

"Prime Minister Silvio Berlusconi has been able to exert undue influence over the public broadcaster RAI," said Karin Deutsch Karlekar, Freedom House's survey managing editor. "This further exacerbates an already worrisome media environment characterized by unbalanced coverage within Berlusconi's enormous media empire." The empire includes Italy's three largest private television stations.

This same government has recently passed—but now temporarily stopped—a new law allowing torture in Italy "only if it is not reiterated." This project, as well as the banning of evolution from schools, has now apparently been corrected, but it is a clear indication of how things can take a terrible turn at any time.

As Dacia Maraini, a respected Italian novelist, recently put it in the *Corriere della sera*, Italy's largest selling newspaper: "It seems a paradox that those who, right this moment, are intent in bringing democracy and liberalism, even imposing it with guns, in countries considered to be underdeveloped, are assuming the same archaic practices of these countries, like the abolition of evolution and the massive introduction of religion in schools, personal use of guns, the glorification of war and racism and, as a completion of all this, the use of torture. When, we ask, will the cutting of hands for thieves be introduced?" □

Most Italians are in fact astonished by recent blatant attempts to limit freedom of thought. Our country has just been downgraded from Free to Partly Free due to increased media concentration and subsequent political pressure.

You can make a lasting impact on the future of skepticism...

when you provide for the *Skeptical Inquirer* in your will.

CSICOP and the *Skeptical Inquirer* changed the terms of discussion in fields ranging from pseudoscience and the paranormal to science and educational policy. You can take an enduring step to preserve their vitality when you provide for the *Skeptical Inquirer* in your will.

Your bequest to CSICOP, Inc., will help to provide for the future of skepticism as it helps to keep the *Skeptical Inquirer* financially secure. Depending on your tax situation, a charitable bequest to CSICOP may have little impact on the net size of your estate—or may even result in a greater amount being available to your beneficiaries.

We would be happy to work with you and your attorney in the development of a will or estate plan that meets your wishes. A variety of arrangements are possible, including: gifts of a fixed amount or a percentage of your estate; living trusts or gift annuities, which provide you with a lifetime income; or a contingent bequest that provides for the *Skeptical Inquirer* only if your primary beneficiaries do not survive you.

For more information, contact Barry Karr, Executive Director of CSICOP, at **716-636-1425**. All inquiries are held in the strictest confidence.

Skeptical Inquirer

CSICOP

Toutatis Threatens Totally

Heads up—the End of the World is coming again! This time it's the asteroid 4179 Toutatis, which, according to no less an authority than the celebrated Swiss UFO contactee Billy Meier, is in danger of slamming into Earth on September 29, 2004 (see http://archives.zinester.com/40491/15876.html). According to NASA, Toutatis will make a close approach to Earth on that date, passing within approximately one million miles, which is nothing on a cosmic scale (see http://echo.jpl.nasa.gov/asteroids/4179_Toutatis/toutatis.html).

But Meier is in contact with the space people from the Pleiades (he calls them "Plejarans"; I suppose that "Pleiadeans" sounds too unwieldy). And according to Michael Horn, who says he is the officially authorized media representative of Meier in the United States (which so far as I know Meier has never disputed), the Plejarans have warned that when Toutatis is closest to Earth, it will suddenly veer off course and head straight toward us. Horn says that it will require a "pre-emptive nuclear strike" to keep this multi-kilometer-sized asteroid from slamming straight into Earth. Before you dismiss this prophecy as the ravings of a demented man, be forewarned that Meier claims a long list of successful predictions (no doubt selectively culled from a much longer list of unsuccessful ones—Meier reportedly has written thousands of pages of predictions). Horn says that Meier predicted back in 1987 that Islamic fanatics would destroy the World Trade Center in New York. If true, this information will be of great interest to the current Congressional investigation into the September 11 attacks: What did Meier know, and when did he know it?

Others are also starting to sound alarm bells. The Web site of the conspiracy-oriented radio host Jeff Rense carries similar warnings (see www.rense.com/general50/sep29th2004.htm). There is even a claim of a secret government missile program to save us from disaster on September 29. And the biblical prophecy expert Arnie Stanton suggests that the encounter with Toutatis indicates that the Second Coming will be just a few months away. Stanton also warns that a larger, as-yet undiscovered asteroid will definitely smack into Earth sometime in 2006.

This is the first time to my knowledge that the world is ending in 2004. The world most recently ended in May of 2003, when a mysterious Planet X, inhabited by Zetans, was reported to be on its way to a disastrous close encounter with Earth, moving the poles and flooding entire countries. The Web site www.zetatalk.com is still there. It talks a lot about the disasters expected in 2003 but says nothing about there being a year 2004; as near as I can tell, their claim is that a disastrous planetary encounter *did* occur in *2003*, but was covered up by NASA. Before that, the "planetary alignment" of May 5, 2000, was threatened as a trigger for all manner of earthly havoc. And of course, society as we know it ended on January 1, 2000, when every major computer system in the world not only failed, but became contagious, infecting even computers that did not suffer from the Y2K bug. The next scheduled major world-ending is in 2012, when, according to a number of reliable experts, the Mayan Calendar simply "runs out," apparently making it impossible for time to continue.

* * *

During April a major conference on UFOs and "Exopolitics," called "the X-Conference," was held near Washington, D.C. (see www.paradigmclock.com/X-Conference/X-Conference.htm). It featured the usual suspects sounding alarm bells over supposed "government cover-ups" of UFO and alien hijinks. However, the speakers at this conference delved even farther into the vast conspiracy than anyone has dared to delve before. Phil Corso Jr., whose late father wrote in *The Day After Roswell* how much of our high-technology (such as transistors) was reverse-engineered from the crashed Roswell saucer, explained that the Roswell aliens were in fact simply *"us"*

Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at www.debunker.com.

from the future, returning as time travelers. This he has learned from notes and manuscripts left by his father, explaining that "we" went back in time to warn "ourselves" about the nuclear threat.

There was much controversy over the claims of Dan Burisch, supposedly a Ph.D. microbiologist who has worked on designer diseases for the military at Area 51 in the Nevada desert—and who also studied the extraterrestrial beings in residence there. Burisch warns of a sinister conspiracy between E.T.s and the military to develop deadly diseases to wipe out humans that the conspirators want to be rid of. Burisch is now reportedly in "lock-down" at Area 51, and is requesting immunity from Congress in return for his testimony about this nefarious program. Some of the UFOlogists at the conference cautiously supported Burisch's tales, others supported the stories even more strongly while accusing the first group of distorting them, and yet a third faction angrily charged that the Burisch supporters were disinformation agents charged with "spinning" wild tales to sow confusion within UFOlogy. (UFOlogists seldom believe that other UFOlogists with whom they disagree are simply mistaken—they are usually either pathological liars or government agents.)

Steven Greer was at the conference to talk about his Project Disclosure, which three years after its much-ballyhooed launch at the National Press Club in Washington, D.C., featuring twenty supposedly credentialed military/intelligence/defense-industry witnesses (reported in this column, March/April 2002) has yet to present any of its supposedly solid evidence of UFO cover-ups to any official government investigations. Greer reportedly acknowledged his disappointment that more progress has not yet been made, but he kept the faith. However, the defrocked psychologist Richard Boylan charged that Greer and others are in fact disinformation agents funded by powerful moneyed interests. Apparently the purpose of the disinformation must be to keep UFOlogists from finding out what Boylan considers the *real* stuff, like alien-hybrid children and "Walk-in" Star Visitors (a contemporary analog of demonic possession).

For another example of the truly stellar quality of contemporary "scientific" UFO research (pun intended), see *The Lawton Triangle UFO Hoax* at http://ufohoax.tripod.com. In March 2002, hoaxer Carl Wilson submitted a dubious-looking, indistinct photo of red and white lights against a black background to Jim Hickman, a "research specialist" with MUFON, the largest UFO group in the U.S. He wrote of seeing these lights in the night sky over Lawton, Oklahoma. Hickman sent a copy of the photo to Bruce Maccabee, the best-known "scientific" UFO photo analyst, who has "authenticated" many classic UFO photos such as those from McMinnville, Oregon, and Gulf Breeze, Florida. It didn't take long for Maccabee to conclude "unless someone has a better idea, I would have to classify this as a True UFO (TRUFO), which might be some sort of Alien Flying Craft (AFC) (or two such craft)?"

Not content with fooling the "experts" once, a few months later Wilson submitted to Hickman a similar photo, purportedly of a UFO seen hovering over Fort Sill, Oklahoma, near Lawton. Hickman again sent a copy to Maccabee, who could barely contain his excitement: "Wow! Got to pull out all the stops on this one! A rare event, two photos of the same (apparently) thing!"

Were these two photos of some alien craft? No, says Wilson: "In reality, these pictures were nothing more than a picture of Microsoft Optical Mouse taken with the room lights and camera flash turned off!" When he revealed his hijinks on the Internet newsgroup alt.alien.research, many asked him whether he was a paid government debunker. He replies, "I did it to demonstrate how easy it is to fool the so-called 'UFO experts' and how willing they are to take any claim at face value. But rather than learn from this example, their reaction was one of hostility." And he reports being harassed in many ways. Wilson concludes, "Clearly many of those involved with or supporting 'UFO research' are less interested in 'Finding the Truth' as they claim, as they are in silencing their critics."

Steven Greer was at the conference to talk about his Project Disclosure, which, three years after its much-ballyhooed launch, has yet to present any of its supposedly solid evidence of UFO cover-ups to any official government investigations.

* * *

While NASA continues to glean astonishing amounts of information about Mars from the Mars Rovers, others are finding plenty of things in the photos that NASA seems to have missed. UFOlogist George Filer, MUFON's Eastern Director, writes that "Our examination of thousands of images has led us to theorize that we might be observing an ancient civilization. . . .

Strangely, the symbols and writing are very similar to English" (see www.virtuallystrange.net/ufo/updates/2004/mar/m10-029.shtml). He notes that "The symbols or letters A, E, G, H, P, V, and Y have been found. The Y symbol is the most numerous and often has deep round holes drilled at the three corners." (The letter B, Filer reminds us, had previously been spotted by the Viking lander carved into a rock way back in 1976.) Filer is far from the only person making such remarkable discoveries. According to a Knight-Ridder news story of March 6, NASA is being deluged by supposed "Mars discoveries" from civilians, including stone tools and dinosaur fossils (see www.sunherald.com/mld/sunherald/news/nation/8124461.htm).

The most dramatic Mars finding would appear to be from the above-mentioned Boylan: based upon news reports that Mars's ice caps appear to be melting, he suggests that Mars is being "terraformed" by alien intelligences to make it more habitable (see www.drboylan.com/trfmars2.html). Boylan informs us that "the U.S. has a tiny forward station on Mars, staffed by astronauts from a secret space program operated by a military black project agency ... the Star Visitors [also] have a long-term presence on Mars." The Mars Society proposes the eventual "terraforming" of Mars to turn it into another habitat for humans, but if Boylan is correct, we may arrive there someday to find the work already finished.

* * *

In the May/June 2003 issue I reported about the giant scorpions allegedly being bred in Iraq by Saddam Hussein, to be used as secret weapons. While no giant scorpion bioweapons have yet been found, the Web site of the *Coast to Coast AM* radio show carries a photo of what is alleged to be a "camel spider" supposedly facing our troops in Iraq. According to one caller to that show, "They run 10 mph, jump three feet, are a nocturnal spider. ... When they bite you, you are injected with Novocain [*sic*] so you go numb instantly. You don't even know you are bitten when you are sleeping, so you wake up with part of your leg or arm missing because it has been gnawing on it all night long" (see the purported photo of this critter at www.coasttocoastam.com/gen/page440.html).

As if to make up for the dearth of giant scorpions, the region is currently in the grips of UFO fever, with sightings running at a high pace, especially in Iran. Sa'dollah Nasiri-Qeydari, head of the Astronomical Society of Iran, told Reuters that people were probably seeing Venus, which was near its greatest brilliance in the evening sky. But Michael Salla, author of *Exopolitics: Political Implications of the Extraterrestrial Presence*, begs to disagree. Salla, who was educated in Australia and has degrees in government and in philosophy, is currently a Researcher in Residence in the Center for Global Peace, American University, in Washington, D.C. He suggests that the UFOs being seen across the Middle East are "very likely related to Stargate/energy portal activity in Iraq/Iran and the region generally. It is very likely that the whole region comprising Iraq/Iran/Afghanistan is a vast energy portal that was strategically chosen for this reason as the home base for extraterrestrials known as the Anunnaki during the Sumerian era" (see www.exopolitics.org/Exo-Comment-15.htm). The anger of Moslems over the U.S. occupation is so intense that, according to Salla, "What they might manifest by all this rage/anger is an opening of the portals and literally the gates of hell opening with the return of the Gods—the Anunnaki—who take the rage around the region as permission to intervene and punish U.S. forces and their allies." But apparently Bush and his fellow conspirators, who head up a secret "shadow government" in collusion with extraterrestrials, knew about this all along, and this was the real reason for the war in Iraq: "it wasn't Oil, Weapons of Mass Destruction, or the 'War against Terror,' just a desire to be in Iraq if and when the energy portals/Stargates became active." He warns, "The ultimate result of extraterrestrial intervention responding to regional rage against the U.S. is a military confrontation that could lead to a domineering extraterrestrial race having a major strategic toehold in human affairs." And wouldn't *that* be terrible! □

Capital Punishment and Homicide

Sociological Realities and Econometric Illusions

Does executing murderers cut the homicide rate or not? Comparative studies show there is no effect. Econometric models, in contrast, show a mixture of results. Why the difference? And which is the more reliable method?

TED GOERTZEL

I have inquired for most of my adult life about studies that might show that the death penalty is a deterrent, and I have not seen any research that would substantiate that point.

Attorney General Janet Reno, January 20, 2000

All of the scientifically valid statistical studies—those that examine a period of years, and control for national trends—consistently show that capital punishment is a substantial deterrent.

Senator Orrin Hatch, October 16, 2002

It happens all too often. Each side in a policy debate quotes studies that support its point of view and denigrates those from the other side. The result is often that research evidence is not taken seriously by either side. This

has led some researchers, especially in the social sciences, to throw up their hands in dismay and give up studying controversial topics. But why bother doing social science research at all if it is impossible to obtain accurate and trustworthy information about issues that matter to people?

There are some questions that social scientists should be able to answer. Either executing people cuts the homicide rate or it does not. Or perhaps it does under certain conditions and not others. In any case, the data are readily available and researchers should be able to answer the question. Of course, this would not resolve the ethical issues surrounding the question, but that is another matter.

Figure 1: Homicide rates per 100,000 population in Texas, New York, and California.

So who is right, Janet Reno or Orrin Hatch? And why can they not at least agree on what the data show? The problem is that each of them refers to bodies of research using different research methods. Janet Reno's statement correctly describes the results of studies that compare homicide trends in states and countries that practice capital punishment with those that do not. These studies consistently show that capital punishment has no effect on homicide rates. Orrin Hatch refers to studies that use econometric modeling. He is wrong, however, in stating that these studies *all* find that capital punishment deters homicide. In fact, some of them find a deterrent effect and some do not.

But this is not a matter of taste. It cannot be that capital punishment deters homicide for comparative researchers but not for econometricians. In fact, the comparative method has produced valid, useful, and consistent findings, while econometrics has failed in this and every similar area of research.

The first of the comparative studies of capital punishment was done by Thorsten Sellin in 1959. Sellin was a sociologist at the University of Pennsylvania and one of the pioneers of scientific criminology. He was a prime mover in setting up the government agencies that collect statistics on crime. His method involved two steps: "First, a comprehensive view of the subject which incorporated historical, sociological, psychological, and legal factors into the analysis in addition to the development of analytical models; and second, the establishment and utilization of statistics in the evaluation of crime" (Toccafundi 1996).

Sellin applied his combination of qualitative and quantitative methods in an exhaustive study of capital punishment in American states. He used every scrap of data that was available, together with his knowledge of the history, economy, and social structure of each state. He compared states to other states and examined changes in states over time. Every comparison he made led him to the "inevitable conclusion . . . that executions have no discernable effect on homicide rates" (Sellin 1959, 34).

Sellin's work has been replicated time and time again, as new data have become available, and all of the replications have confirmed his finding that capital punishment does not deter homicide (see Bailey and Peterson 1997, and Zimring and Hawkins 1986). These studies are an outstanding example of what statistician David Freedman (1991) calls "shoe leather" social research. The hard work is collecting the best available data, both quantitative and qualitative. Once the statistical data are collected, the analysis consists largely in displaying them in tables, graphs, and charts which are then interpreted in light of qualitative knowledge of the states in question. This research can be understood by people with only modest statistical background. This allows consumers of the research to make their own interpretations, drawing on their qualitative knowledge of the states in question.

Figure 1 is an example of the kind of chart Sellin prepared, using recent data. The graph compares homicide rates per 100,000 population in Texas, New York, and California. From 1982 to 2002, Texas executed 239 prisoners, California ten, and New York none. The trends in homicide statistics are very similar in all three states, all of which follow national trends. These states were chosen arbitrarily, but data for other states are readily available. If you prefer to compare Texas to Oklahoma, Arkansas, or New Mexico, the data are readily available in back issues of the *Statistical Abstract of the United States* and *Uniform Crime Reports*. The results will be much the same.

Hundreds of comparisons of this sort have been made, and they consistently show that the death penalty has no effect.

Ted Goertzel is a professor of sociology, Sociology Department, Rutgers University, Camden, NJ 08102. E-mail: goertzel@camden.rutgers.edu.

There have also been international comparative studies. Archer and Gartner (1984) examined fourteen countries that abolished the death penalty and found that abolition did not cause an increase in homicide rates. This research has been convincing to most criminologists (Radelet and Akers n.d.; Fessenden 2000), which is why Janet Reno was told that there was no valid research linking capital punishment to homicide rates.

The studies that Orrin Hatch referred to use a very different methodology: econometrics, also known as multiple regression modeling, structural equation modeling, or path analysis. This involves constructing complex mathematical models on the assumption that the models mirror what happens in the real world. As I argued in a previous SKEPTICAL INQUIRER article (Goertzel 2002), this method has consistently failed to offer reliable and valid results in studies of social problems where the data are very limited. Its most successful use is in making predictions in areas where there is a large flow of data for testing. The econometric literature on capital punishment has been carefully reviewed by several prominent economists and found wanting. There is simply too little data and too many ways to manipulate it. In one careful review, McManus (1985, 417) found that: "there is much uncertainty as to the 'correct' empirical model that should be used to draw inferences, and each researcher typically tries dozens, perhaps hundreds, of specifications before selecting one or a few to report. Usually, and understandably, the ones selected for publication are those that make the strongest case for the researcher's prior hypothesis."

Models that find deterrence effects of capital punishment often rely on rather bizarre specifications. In a rigorous and comprehensive review Cameron (1994, 214) observed that, "What emerges most strongly from this review is that obtaining a significant deterrent effect of executions seems to depend on adding a set of data with no executions to the time series and including an executing/non-executing dummy in the cross-section analysis . . . there is no clear justification for the latter practice."

In less technical language, the researchers included a set of years when there were no executions, then introduced a control variable to eliminate the nonexistent variance. The other day upon the stair, they saw some variance that wasn't there. It wasn't there again today, thank goodness their model scared it away. Not all the studies rely on this particular maneuver, but they all depend on techniques that demand too much from the available data.

Since there are so many ways to model inadequate data, McManus (1985, 425) was able to show that researchers whose prior beliefs led them to structure their models in different ways would obtain predictable conclusions: "The data analyzed are not sufficiently strong to lead researchers with different prior beliefs to reach a consensus regarding the deterrent effects of capital punishment. Right-winger, rational-maximizer, and eye-for-an-eye researchers will infer that punishment deters would-be murderers, but bleeding-heart and crime-of-passion researchers will infer that there is no significant deterrent effect."

The Mythical World of *Ceteris Paribus*

Econometricians inhabit the mythical land of *Ceteris Paribus*, a place where everything is constant except the variables they choose to write about. *Ceteris Paribus* has much in common with the mythical world of Flatland in Edwin Abbot's (1884) classic fairy tale. In Flatland everything moves along straight lines, flat plains, or rectangular boxes. In Flatland, statistical averages become mathematical laws. For example, it is true that, on the average, tall people weigh more than short people. But, in the real world, not every tall person weighs more than a shorter one. In Flatland knowing someone's height would be enough to tell you their precise weight, because both vary only on a straight line. In Flatland, if you plotted height and weight on a graph with height on one axis and weight on the other, all the points would fall on a straight line.

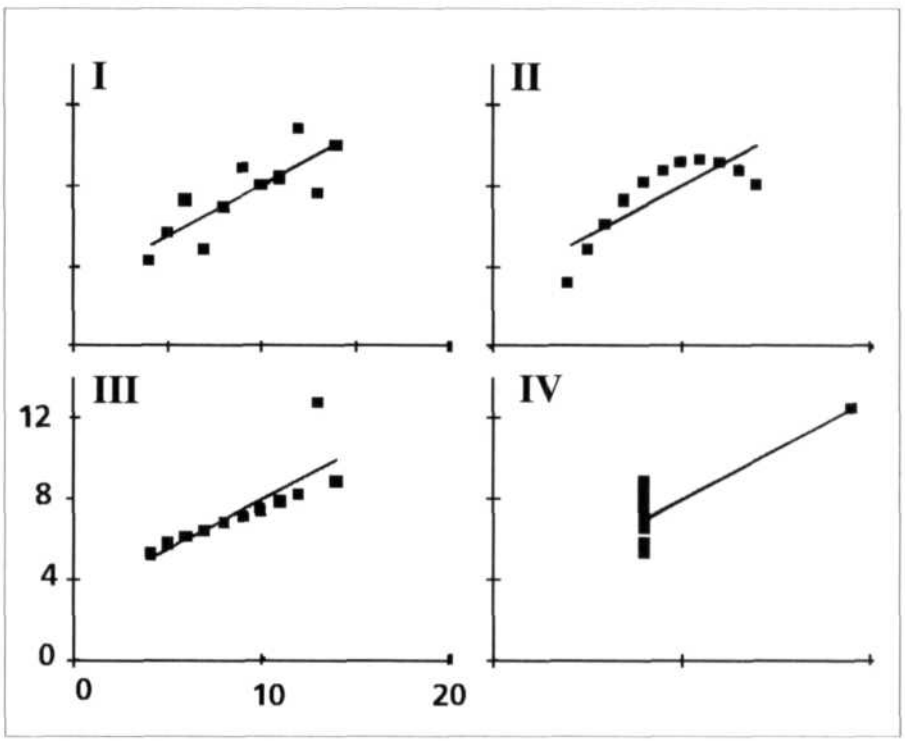


Figure 2: Anscombe's Quartet (by J. Randall Flannigan)

Of course, econometricians know that they don't live in Flatland. But the mathematics works much better when they pretend they do. So they adjust the data in one way or another to make it straighter (often by converting it to logarithms). Then they qualify their remarks, saying "capital punishment

deters homicide, *ceteris paribus*." But when the real-world data diverge greatly from the straight lines of Flatland, this can lead to bizarre results.

Statistician Francis Anscombe (1973) demonstrated how bizarre the Flatland assumption can be. He plotted four graphs that have become known as Anscombe's Quartet. Each of the graphs shows the relationship between two variables. The graphs are very different, but for a resident of Flatland they are all the same. If we approximate them with a straight line (following a "linear regression equation") the lines are all the same (figure 2). Only the first of Anscombe's four graphs is a reasonable candidate for a linear regression analysis, because a straight line is a reasonable approximation for the underlying pattern.

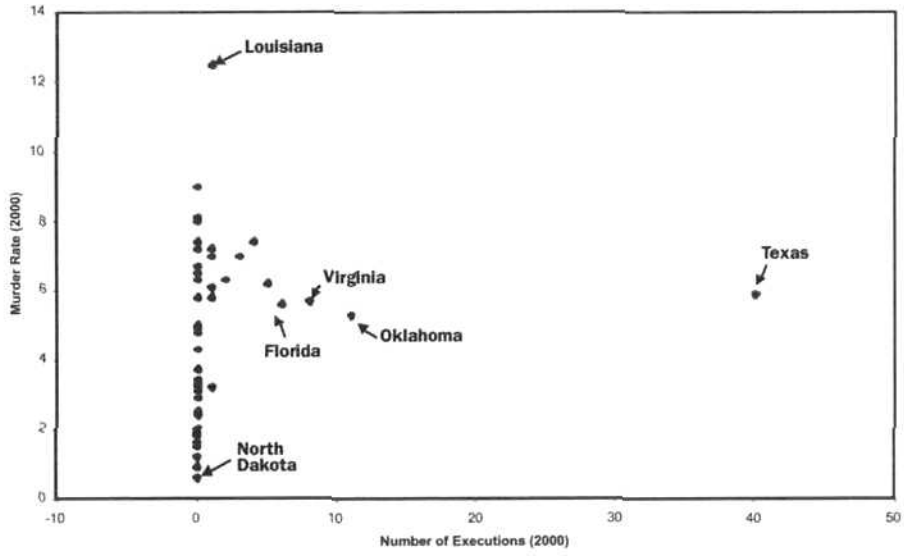


Figure 3: Executions and murder rates in the United States.

The data on capital punishment and homicide, when plotted in figure 3, look a lot like Anscombe's fourth quartet. Most of the states had no executions at all. One state, Texas, accounts for forty of the eighty-five executions in the year shown (the patterns for other years are quite similar). An exceptional case or "outlier" of this dimension completely dominates a multiple regression analysis. Any regression study will be primarily a comparison of Texas with everywhere else. Multiple regression is simply inappropriate with this data, no matter how hard the analyst tries to force the data into a linear pattern.

Unfortunately, econometricians continue to use multiple regression on capital punishment data and to generate results that are cited in Congressional hearings. In recent examples, Mocan and Gittings (2001) concluded that each execution decreases the number of homicides by five or six while Dezhbaksh, Rubin, and Shepherd (2002) argued that each execution deters eighteen murders. Cloninger and Marchesini (2001) published a study finding that the Texas moratorium from March 1996 to April 1997 increased homicide rates, even though no increase can be seen in the graph (figure 1). The moratorium simply increased homicide in comparison to what their econometric model said it would have otherwise been. Of all the econometric myths, the wildest is this: We know what would have been.

Cloninger and Marchesini concede that "studies such as the present one that rely on inductive statistical analysis cannot prove a given hypothesis correct." However, they argue that when a large number of such studies give the same result, this provides "robust evidence" which "causes any neutral observer pause." But if McManus is correct that econometricians are likely to specify models to fit their preconceptions, then if many of them reach the same conclusion it may just mean that they have the same bias. Actually, there are a variety of biases among econometricians, which is why there are almost as many on one side as on the other of this issue. In response to Ehrlich's (1975) initial econometric study, other econometricians using the same data included Yunker (1976), who found a stronger deterrent effect than Ehrlich, and Cloninger (1977), who supported his findings. But Bowers and Pierce (1975), Passel and Taylor (1977), and Hoenack and Weiler (1980) found no deterrence at all.

Econometricians often dismiss the kind of comparative research that Thorsten Sellin did as crude and unsophisticated when compared to their use of complex mathematical formulas. But mathematical complexity does not make for good social science. The goal of multiple regression is to convert messy sociological realities into math problems that can be resolved with the certainty of mathematical proof. Econometricians believe they can control for the myriad variables that affect homicide rates, just as a chemist eliminates impurities to see how two chemicals interact in their pure form. But they cannot convert the real world into a Flatland, so they use statistical adjustments to compensate. With these adjustments, they claim to answer the *Ceteris Paribus* question: If everything else were equal, what would the relationship between capital punishment and homicide be?

It would be handy for social scientists if we lived in a Flatland where everything else was equal and questions could be answered with a few calculations. But multivariate statistical analysis does not answer real-world questions such as, "does Texas, with a high execution rate, have a lower homicide rate than similar states?" or "did the homicide rate go down when Texas began executing people, compared to trends in other states that did not?" Instead, it answers the question, "If we use the latest, most sophisticated statistical methods to control for extraneous variables, can we say that the death penalty deters homicide rates *other things being equal?*" After decades of effort by many diligent researchers, we now know the answer to this question: There are many ways to adjust things statistically,

and the answer will depend on which one is chosen. We also know that of the many possible ways to specify a regression model, each researcher is likely to prefer one that will give results consistent with his or her predispositions.

It is time to abandon the illusion that mathematics can convert the real world into the mythical land of *Ceteris Paribus*. Social science can provide valid and reliable results with methods that present the data with as little statistical manipulation as possible and interpret it in light of the best qualitative information available. The value of this research is shown by its success in demonstrating that capital punishment has not deterred homicide.

References

Abbot, Edwin. 1884. Flatland: A romance of many dimensions. Accessed on January 29, 2004, at: www.alcyone.com/max/lit/flatland/.

Anscombe, Francis. 1973. Graphs in statistical analysis. *American Statistician* 27, 17–21.

Archer, Dane, and Rosemary Gartner. 1984. Homicide and the death penalty: A cross-national test of a deterrence hypothesis. In Archer and Gartner, *Violence and Crime in Cross-National Perspective*, New Haven: Yale University Press.

Bailey, William, and Ruth Peterson. 1997. Murder, capital punishment, and deterrence: A review of the literature. In Hugo Bedau, ed., *The Death Penalty In America: Current Controversies*. New York: Oxford University Press.

Bowers, W.J., and J.L. Pierce. 1975. The illusion of deterrence in Isaac Ehrlich's work on capital punishment. *Yale Law Journal* 85: 187–208.

Cameron, Samuel. 1994. A review of the econometric evidence on the affects of capital punishment. *Journal of Socio-Economics* 23: 197–214.

Cloninger, Dale. 1977. Deterrence and the death penalty: A cross-sectional analysis. *Journal of Behavioral Economics* 6, 87–107.

Dezhbaksh, Hashem, Paul Robin, and Joanna Shepherd. 2002. Does capital punishment have a deterrent effect? New evidence from post-moratorium panel data. *American Law and Economics Review* 5(2): 344–376. Accessed on January 12, 2004, from: http://aler.oupjournals.org/cgi/content/abstract/5/2/344.

Ehrlich, Isaac. 1975. The deterrent effect of capital punishment: A question of life and death. *American Economic Review* 65: 397–417.

Fessenden, Ford. 2000. Deadly statistics: A survey of crime and punishment. *The New York Times* September 22, 2000. Accessed on January 20, 2004 from: www.nytimes.com/2000/09/22/national/22STUD.html?ex=1074747600&en=908c0021415e7e9a&ei=5070.

Freedman, David. 1991. Statistical models and shoe leather. *Sociological Methodology* 21: 291–313.

Goertzel, Ted. 2002. Myths of murder and multiple regression. SKEPTICAL INQUIRER 26(1): 19–23.

Hatch, Orrin. 2002. Minority views, appended to the "report" of the Committee on the Judiciary of the United States Senate on The Innocence Protection Act of 2002, 107th Congress, Second Session, Report 107-315, Calendar No 731. Accessed on January 12, 2004, from: http://frwebgate.access.gpo.gov/cgibin/getdoc.cgi?dbname=107_cong_reports&docid=f:sr315.107.pdf.

Hoenack, Stephen, and William Weiler. 1980. A structural model of murder behavior and the criminal justice system. *American Economic Review* 70, 327–41.

McManus, Walter. 1985. Estimates of the deterrent effect of capital punishment: The importance of the researcher's prior beliefs. *Journal of Political Economy* 93: 417–425.

Mocan, Naci, and Kaj Gittings. 2001. Pardons, executions and homicide. Working Paper 8639, National Bureau of Economic Research. Accessed on January 12, 2004, from: www.nber.org/papers/w8639.

Passell, Peter, and John Taylor. 1977. The deterrent effect of capital punishment: Another view. *American Economic Review* 67, 445.

Radelet, Michael, and Ronald Akers. (No date). Deterrence and the death penalty: The view of experts. accessed on January 23, 2004, from: http://sun.soci.niu.edu/~critcrim/dp/dppapers/mike.deterrence.

Reno, Janet. 2002. Quoted in Mocan and Gittings 2001.

Sellin, Thorsten. 1959. *The Death Penalty*. American Law Institute, Philadelphia.

Toccafundi, David. 1996. The Sellin Collection at Penn. Accessed on January 24, 2004, at: http://www.library.upenn.edu/exhibits/pennhistory/library/sellin.html.

Yunker, James A. 1976. Is the death penalty a deterrent to homicide? Some time series evidence. *Journal of Behavioral Economics* Vol. 5, 45–81.

Zimring, Franklin, and Gordon Hawkins. 1986. *Capital Punishment and the American Agenda*. Cambridge: Cambridge University Press.

THE 5TH
World Skeptics Congress
SOLVING MYSTERIES

The World's Top Investigators of Extraordinary Claims Meet for an Extraordinary Weekend

October 8–10, 2004
Abano Terme (Padua - Venice) - Italy

Parapsychology and Skeptics: Is Dialogue Possible?
What Is the Future of Skepticism?
Dangers of Alternative Medicine

Hoaxes, Fakes and Myths
Investigating Mysteries
Magic and the Psychology of Deception

Presented by **CICAP** (Comitato Italiano per il Controllo delle Affermazioni sul Paranormal) and **CSICOP**

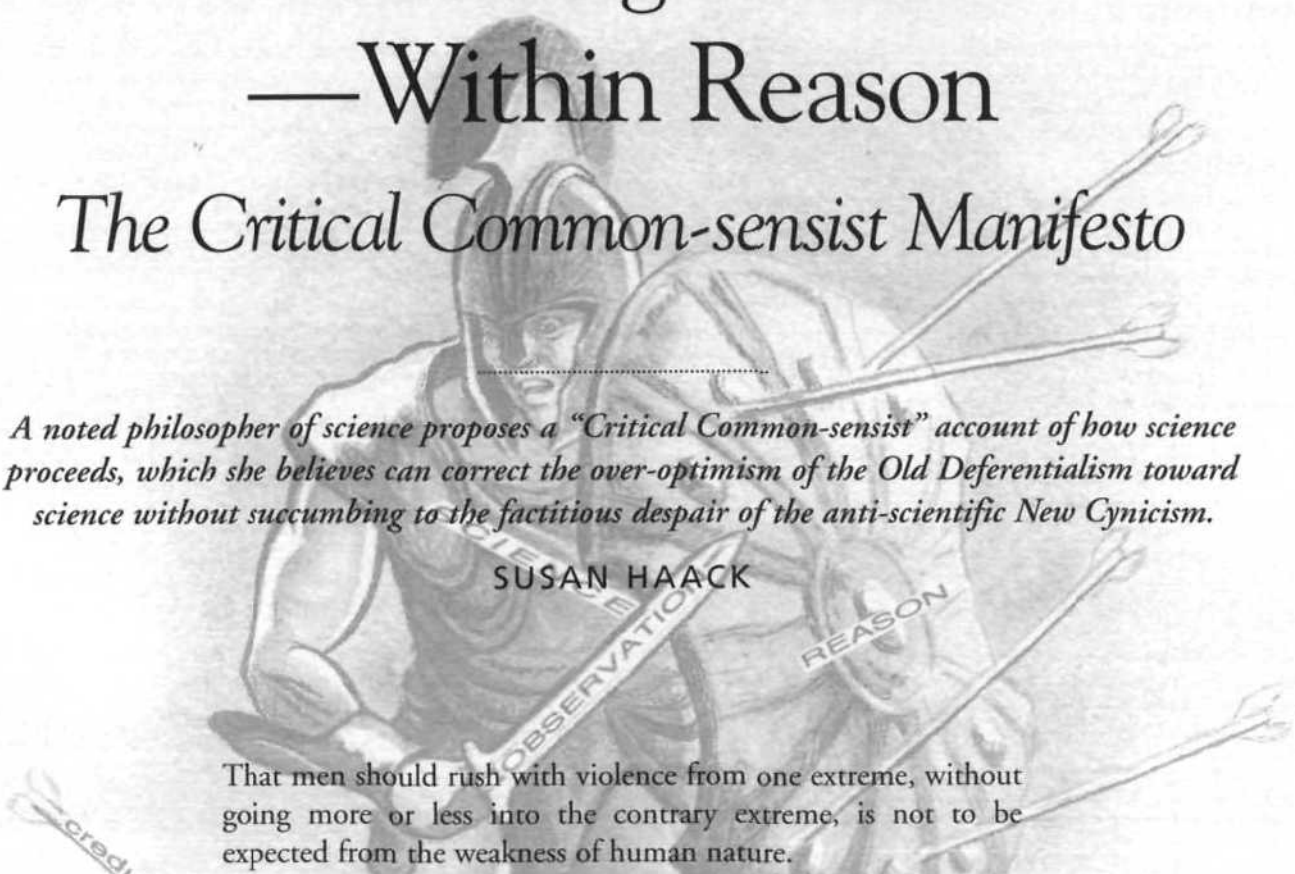
Call 1-800-634-1610 or visit www.cicap.org/congress for more information

Defending Science —Within Reason

The Critical Common-sensist Manifesto

A noted philosopher of science proposes a "Critical Common-sensist" account of how science proceeds, which she believes can correct the over-optimism of the Old Deferentialism toward science without succumbing to the factitious despair of the anti-scientific New Cynicism.

SUSAN HAACK



> That men should rush with violence from one extreme, without going more or less into the contrary extreme, is not to be expected from the weakness of human nature.
>
> —Thomas Reid, *Essays on the Intellectual Powers* (1875)

Attitudes to science range all the way from uncritical admiration at one extreme, through distrust, resentment, and envy, to denigration and outright hostility at the other. We are confused about what science can and what it can't do, and about how it does what it does; about how science differs from literature or art; about whether science is really a threat to religion; about the role of science in society and the role of society in science. And we are

Gerald Fried

ambivalent about the value of science. We admire its theoretical achievements, and welcome technological developments that improve our lives; but we are disappointed when hoped-for results are not speedily forthcoming, dismayed when scientific discoveries threaten cherished beliefs about ourselves and our place in the universe, distrustful of what we perceive as scientists' arrogance or elitism, disturbed by the enormous cost of scientific research, and disillusioned when we read of scientific fraud, misconduct, or incompetence.

Complicated as they are, the confusions can be classified into two broad kinds, the scientistic and the anti-scientific. Scientism is an exaggerated kind of deference towards science, an excessive readiness to accept as authoritative any claim made by the sciences, and to dismiss every kind of criticism of science or its practitioners as anti-scientific prejudice. Anti-science is an exaggerated kind of suspicion of science, an excessive readiness to see the interests of the powerful at work in every scientific claim, and to accept every kind of criticism of science or its practitioners as undermining its pretensions to tell us how the world is. The problem, of course, is to say when the deference, or the suspicion, is "excessive."

Disentangling the confusions is made harder by an awkward duality of usage. Sometimes the word "science" is used simply as a way of referring to certain disciplines: physics, chemistry, biology, and so forth, usually also anthropology and psychology, sometimes also sociology, economics, and so on. But often—perhaps more often than not—"science" and its cognates are used honorifically: advertisers urge us get our clothes cleaner with new, scientific, Wizzo; teachers of critical thinking urge us to reason scientifically, to use the scientific method; juries are more willing to believe a witness when told that what he offers is scientific evidence; astrology, water-divining, homeopathy, or chiropractic or acupuncture are dismissed as pseudosciences; skeptical of this or that claim, people complain that it lacks a scientific explanation, or demand scientific proof. And so on. "Scientific" has become an all-purpose term of epistemic praise, meaning "strong, reliable, *good*." No wonder, then, that psychologists and sociologists and economists are sometimes so zealous in insisting on their right to the title. No wonder, either, that practitioners in other areas—"Management Science," "Library Science," "Military Science," even "Mortuary Science"—are so keen to claim it.

In view of the impressive successes of the natural sciences, this honorific usage is understandable enough. But it is thoroughly unfortunate. It obscures the otherwise obvious fact that not all or only practitioners of disciplines classified as sciences are honest, thorough, successful inquirers; when plenty of scientists are lazy, incompetent, unimaginative, unlucky, or dishonest, while plenty of historians, journalists, detectives, etc., are good inquirers. It tempts us into a fruitless preoccupation with the problem of demarcating *real* science from pretenders. It encourages too thoughtlessly uncritical an attitude to the disciplines classified as sciences, which in turn provokes envy of those disciplines, and encourages a kind of scientism—inappropriate mimicry, by practitioners of other disciplines, of the manner, the technical terminology, the mathematics, etc., of the natural sciences. And it provokes resentment of the disciplines so classified, which encourages anti-scientific attitudes. Sometimes you can even see the envy and the resentment working together: for example, with those self-styled ethnomethodologists who undertake "laboratory studies" of science, observing, as they would say, part of the industrial complex in the business of the production of inscriptions; or—however grudgingly, you have to admit the rhetorical brilliance of this self-description—with "creation science." *And*, most to the present purpose, this honorific usage stands in the way of a straightforward acknowledgement that science—science, that is, in the descriptive sense—is neither sacred nor a confidence trick.

Science is not sacred: like all human enterprises, it is thoroughly fallible, imperfect, uneven in its achievements, often fumbling, sometimes corrupt, and of course incomplete. Neither, however, is it a confidence trick: the natural sciences, at any rate, have surely been among the most successful of human enterprises. The core of what needs to be sorted out concerns the nature and conditions of scientific knowledge, evidence, and inquiry; it is epistemological. (No, I haven't forgotten Jonathan Rauch's wry observation: "If you want to empty the room at a cocktail party, say 'epistemology'";[1] but the word is pretty well indispensable for my purposes because, unlike "theory of knowledge," it has adjectival and adverbial forms.) What we need is an understanding of inquiry in the sciences which is, in the ordinary, nontechnical sense of the word, realistic, neither overestimating nor underestimating what the sciences can do.

What we have, however, is a confusing Babel of competing, unsatisfactory accounts of the epistemology of science. How did we come to such a pass?

From the Old Deferentialism to the New Cynicism

Once upon a time—the phrase is a warning that what follows will be cartoon history—the epistemological *bona fides* of good empirical science needed to be defended against the rival claims of sacred scripture or *a priori* metaphysics. In due course it came to be thought that science enjoys a peculiar epistemological authority because of its uniquely objective and rational method of inquiry. In the wake of the extraordinary successes of the new, modern logic, successive efforts to articulate the "logic of science" gave rise to umpteen competing versions of what I call the "Old Deferentialism": science progresses inductively, by accumulating true or probably true theories confirmed by empirical evidence, by observed facts; or deductively, by testing theories against basic statements and, as falsified conjectures are replaced by corroborated ones,

Susan Haack (Coral Gables, Florida) is Cooper Senior Scholar in Arts & Sciences, professor of philosophy, and professor of law at the University of Miami. Her books include Philosophy of Logics, Evidence and Inquiry, Manifesto of a Passionate Moderate, *and* Defending Science—Within Reason *(Prometheus 2003), her latest, from which this article is excerpted by permission.*

improving the verisimilitude of its theories; or instrumentally, by developing theories which, though not themselves capable of truth, are efficient instruments of prediction; or, etc., etc. There were numerous obstacles: Humean skepticism about induction; the paradoxes of confirmation; the "new riddle of induction" posed by Nelson Goodman's "grue"; Russell Hanson's and others' thesis of the theory-dependence of observation; W.V.O. Quine's thesis of the underdetermination of theories even by all possible observational evidence. But these, though acknowledged as tough, were assumed to be superable, or avoidable.

It is tempting to describe these problems in Kuhnian terms, as anomalies facing the Old Deferentialist paradigm just as a rival was beginning to stir. Thomas Kuhn himself, it soon became apparent, hadn't intended radically to undermine the pretensions of science to be a rational enterprise. But most readers of *The Structure of Scientific Revolutions*, missing many subtleties and many ambiguities, heard only: science progresses, or "progresses," not by the accumulation of well-confirmed truths, or even by the elimination of conjectures shown to be false, but by revolutionary upheavals in a cataclysmic process the history of which is afterwards written by the winning side; there are no neutral standards of evidence, only the incommensurable standards of different paradigms; the success of a scientific revolution, like the success of a political revolution, depends on propaganda and control of resources; a scientist's shift of allegiance to a new paradigm is less like a rational change of mind than a religious conversion—a conversion after which things look so different to him that we might almost say he lives "in a different world."

Even so, a quarter of a century ago now, when Paul Feyerabend proclaimed that there is no scientific method, that appeals to "rationality" and "evidence" are no more than rhetorical bullying, that science is not superior to, only better entrenched than, astrology or voodoo, he was widely regarded—he described himself—as the "court jester" of the philosophy of science. Post-Kuhnian Deferentialists, adding "incommensurability" and "meaning-variance" to their list of obstacles to be overcome, modified and adapted older approaches; but remained convinced not only of the rationality of the scientific enterprise, but also of the power of formal, logical methods to account for it.

But then radical sociologists, feminists and multiculturalists, radical literary theorists, rhetoricians, and semiologists, and philosophers outside strictly philosophy-of-science circles, began to turn their attention to science. Proponents of this new almost-orthodoxy, though they disagreed among themselves on the finer points, were unanimous in insisting that the supposed ideal of honest inquiry, respect for evidence, concern for truth, is a kind of illusion, a smokescreen disguising the *operations of power, politics, and rhetoric. Insofar as they* were concerned at all with the problems that preoccupied mainstream philosophy of science—theory-dependence, underdetermination, incommensurability, and the rest—they proclaimed them insuperable, further confirmation that the epistemological pretensions of the sciences are indefensible. Appeal to "facts" or "evidence" or "rationality," they maintained, is nothing but ideological humbug disguising the exclusion of this or that oppressed group. *Science is largely* or wholly a matter of interests, social negotiation, or of myth-making, the production of inscriptions or narratives; not only does it have no peculiar epistemic authority and no uniquely rational method, but it is really, like all purported "inquiry," just politics. We arrived, in short, at the New Cynicism.

Science is not sacred: like all human enterprises, it is thoroughly fallible, imperfect, uneven in its achievements, often fumbling, sometimes corrupt, and of course incomplete. Neither, however, is it a confidence trick: the natural sciences, at any rate, have surely been among the most successful of human enterprises.

Feyerabend, who seems in retrospect the paradigm Old Cynic, promised to free us of "the tyranny of . . . such abstract concepts as 'truth,' 'reality,' or 'objectivity'." Now New Cynics like Harry Collins assure us that "the natural world has a small or nonexistent role in the construction of scientific knowledge"; and Kenneth Gergen that the validity of theoretical propositions in the sciences "is in no way affected by factual evidence." Ruth Hubbard urges that "[f]eminist science must insist on the political nature and content of scientific work"; and Sandra Harding asks why it isn't "as illuminating and honest to refer to Newton's laws as 'Newton's rape manual' as it is to call them 'Newton's mechanics'." Ethnomethodologist of science Bruno Latour announces that "[a]ll this business about rationality and irrationality is the result of an attack by someone on associations that stand in the way"; and rhetorician of science Steve Fuller proposes "a 'shallow' conception . . . that locates the authoritative character of science, not in an esoteric set of skills or a special understanding of reality, but in the appeals to its form of knowledge that *others* feel they must

make to legitimate their own activities." Richard Rorty informs readers that "[t]he only sense in which science is exemplary is that it is a model of human solidarity," and Stanley Fish that "the distinction between baseball and science is not finally so firm."[2] Reacting against the scientism towards which the Old Deferentialism sometimes veered uncomfortably close, rushing with violence into the opposite extreme, the New Cynics take an unmistakably anti-scientific tone.

Perhaps it is no wonder that many scientists came to regard philosophy of science as at best irrelevant—"about as useful to scientists as ornithology is to birds." With the exception of a few enthusiastic Popperians, working scientists seem to have been mostly unaware of or indifferent to Old Deferentialist aspirations to offer them advice on how to proceed. But in 1987—provoked by Alan Chalmers' observation, at the beginning of his popular introduction to philosophy of science, that "[w]e start off confused and end up confused on a higher level"[3]—physicists Theocharis and Psimopoulos published an impassioned critique of "betrayers of the truth": Popper, Kuhn, Lakatos, and Feyerabend, "the worst enemy of science." And as the influence of New Cynicism grew, more scientists were moved to defend the honor of their enterprise: Paul Gross and Norman Levitt in *Higher Superstition*; Max Perutz denouncing rhetoric of science as "a piece of humbug masquerading as an academic discipline"; Sheldon Glashow deconstructing his letter of invitation to a conference on "The End of Science"; Alan Sokal parodying postmodernist "cultural critique" of science; and Steven Weinberg replying to the "cultural adversaries" of science.[4] Sometimes they made a good showing; but, not surprisingly, they didn't aspire to supply the realistic account of the epistemology of science required for an adequate defense against the extravagances of the New Cynicism.

Mainstream philosophy of science, meanwhile, had become increasingly specialized and splintered. Though many philosophers of science ignored the New Cynicism, a few tackled it head on: John Fox criticizing self-styled "ethnomethodologists of science"; Larry Laudan in running battles with proponents of the "Strong Programme" in sociology of science; Mario Bunge protesting the influence of Romanticism and subjectivism; Noretta Koertge wrestling with the social constructivists.[5] Sometimes they made a good showing too. And with an increased readiness to accommodate social aspects of science, a turn towards one or another form of naturalism, and, since Bas Van Fraassen's influential defense of constructive empiricism, something of a retreat from strong forms of scientific realism, there were efforts to acknowledge the elements of truth to which the New Cynicism gestures, without succumbing to its extravagances. But some mainstream philosophers of science—especially, perhaps, those most anxious not to offend the feminists—seem to have gone too far in the direction of the New Cynicism: as when Ronald Giere suggested that there might be something in the Nazi concept of "Jewish physics," as in feminist complaints of the masculinity of science;[6] and many others, still clinging to the Old Deferentialist reliance on formal, logical methods as sufficient to articulate the epistemology of science, seem not to have gone far enough. In my opinion, anyway, the realistic understanding we need still eludes us.

Still, as I articulate my Critical Common-sensist account —which I believe can correct the over-optimism of the Old Deferentialism without succumbing to the factitious despair of the New Cynicism—I won't forget the cautionary story of the student who is said to have observed in his Introduction to Philosophy examination that while some philosophers believe that God exists, and some philosophers believe that God does not exist, "the truth, as so often, lies somewhere in between." Though there are elements of truth in both the Old Deferentialism and the New Cynicism, a crude split-the-difference approach won't do; for as Algernon observes in Oscar Wilde's *The Importance of Being Earnest*, the truth "is seldom pure and never simple."

Critical Common-sensism

Critical Common-sensism acknowledges, like the Old Deferentialism, that there are objective standards of better and worse evidence and of better and worse conducted inquiry; but proposes a more flexible and less formal understanding of what those standards are. Critical Common-sensism acknowledges, like the New Cynicism, that observation and theory are interdependent, that scientific vocabulary shifts and changes meaning, and that science is a deeply social enterprise; but sees these, not as obstacles to an understanding of how the sciences have achieved their remarkable successes, but as part of such an understanding.

The core standards of good evidence and well-conducted inquiry are not internal to the sciences, but common to empirical inquiry of every kind. In judging where science has succeeded and where it has failed, in what areas and at what times it has done better and in what worse, we are appealing to the standards by which we judge the solidity of empirical beliefs, or the rigor and thoroughness of empirical inquiry, generally. Often, to be sure, only a specialist can judge the weight of evidence or the thoroughness of precautions against experimental error, etc.; for such judgments require a broad and detailed knowledge of background theory, and a familiarity with technical vocabulary, not easily available to the lay person. Nevertheless, respect for evidence, care in weighing it, and persistence in seeking it out, so far from being exclusively scientific desiderata, are the standards by which we judge *all* inquirers, detectives, historians, investigative journalists, etc., as well as scientists. In short, the sciences are not epistemologically privileged.

They are, however, epistemologically distinguished; the natural sciences at least, fallible and imperfect as they are, have succeeded remarkably well by the core epistemological standards of all serious inquiry. But distinction, unlike privilege, has to be earned; and the natural sciences have earned, not our uncritical deference, but our tempered respect.

The evidence for scientific claims and theories—consisting, not simply of the "data" or "observation statements" of the Old Deferentialism, but of experiential evidence and reasons working together—is like empirical evidence generally, but even more complex and ramifying. Think of the controversy over that four-billion-year-old meteorite discovered in Antarctica,

thought to have come from Mars about 11,000 years ago, and found to contain what might possibly be fossilized bacteria droppings. Some space scientists think this is evidence of early Martian life; others think the bacterial traces might have been picked up while the meteorite was in Antarctica; others again believe that what look like fossilized bacteria droppings might be merely artifacts of the instrumentation. How do they know that the meteorite's giving off these gases when heated indicates that it comes from Mars? That it is about 4 billion years old? That this is what fossilized bacteria droppings look like? —like crossword entries, reasons ramify in all directions.

How reasonable a crossword entry is depends on how well it is supported by its clue and any already-completed intersecting entries; on how reasonable those other entries are, independent of the entry in question; and on how much of the crossword has been completed. Similarly, what makes evidence stronger or weaker, a claim more or less warranted, depends on how supportive the evidence is; on how secure it is, independent of the claim in question; and on how much of the relevant evidence it includes.

While judgments of evidential quality are perspectival, dependent on background beliefs about, for instance, what evidence is relevant to what, evidential quality itself is objective; the determinants of evidential quality are not subjective or context-dependent, as New Cynics suppose. Neither, however, are they purely logical, as Old Deferentialists thought; they are *worldly*, depending both on scientists' interactions with particular things and events in the world, and on the relation of scientific language to kinds and categories of things. Observation interacts with background beliefs, as clues interact with already-completed crossword entries: what observations are taken to be relevant, and what is noticed when observations are made, depends on background assumptions; and the workings of instruments of observation, such as the mass spectrometer and ultra-high-resolution transmission microscope on which those space scientists relied, depend on other scientific theories.

Scientific inquiry is continuous with the most ordinary of everyday empirical inquiry. There is no mode of inference, no "scientific method," exclusive to the sciences and guaranteed to produce true, probably true, more nearly true, or more empirically adequate, results. As Percy Bridgman put it, "the scientific method, as far as it is a method, is nothing more than doing one's damnedest with one's mind, no holds barred."[7] And, as far as it is a method, it is what historians or detectives or investigative journalists or the rest of us do when we really want to find something out: make an informed conjecture about the possible explanation of a puzzling phenomenon, check how it stands up to the best evidence we can get, and then use our judgment whether to accept it, more or less tentatively, or modify, refine, or replace it.

Inquiry is difficult and demanding, and we very often go wrong. Sometimes the problem is a failure of will; we don't really want to know badly enough to go to all the trouble of finding out, or we really *don't* want to know, and go to a lot of trouble not to find out. And even with the best will in the world, we often fail. Our senses, our imaginations, and our intellects are limited; we can't always see, or guess, or reason, well enough. The remarkable successes of the natural sciences are due, not to a uniquely rational scientific method, but to the vast range of "helps" to inquiry devised by generations of scientists to overcome natural human limitations. Instruments of observation extend sensory reach; models and metaphors stretch imaginative powers; linguistic and conceptual innovations enable a vocabulary that better represents real kinds of thing and event; techniques of mathematical and statistical modelling enable complex reasoning; the cooperative and competitive engagement of many people in a great mesh of sub-communities within and across generations permits division of labor and pooling of evidence, and—though very fallibly and imperfectly, to be sure—has helped keep most scientists, most of the time, reasonably honest.

As you and I can complete the crossword faster and more accurately if your knowledge of Shakespeare and quick ear for puns complements my knowledge of popular music and quick eye for anagrams, so scientific inquiry is advanced by complementary talents. And interactions among scientists, both within and across generations, are essential not only to the division of scientific labor, but also to the sharing of scientific evidence, to a delicate mesh of reasonable confidence in others' competence and honesty. Moreover, scientific claims are better and worse warranted, and there is a large grey area where opinions may reasonably differ about whether a claim is yet sufficiently warranted to put in the textbooks, or should be subjected to further tests, assessed more carefully relative to an alternative, or what. There can no more be rules for when a theory should be accepted and when rejected than there could be rules for when to ink in a crossword entry and when to rub it out; "the" best procedure is for different scientists, some bolder, some more cautious, to proceed differently.

Scientific theories are (normally) either true or else false. A scientific claim or theory is true just in case things are as it says; e.g., if it says that DNA is a double-helical, backbone-out macromolecule with like-with-unlike base pairs, it is true just in case DNA *is* a double-helical, backbone-out macromolecule with like-with-unlike base pairs. Truth, like evidential quality, is objective; i.e., a claim is true or false, as evidence is better or worse, independent of whether anybody, or everybody, believes it to be so. But there is no guarantee that every scientist is entirely objective, i.e., is a completely unbiased and disinterested truth-seeker, immune to prejudice and partisanship; far from it. Nevertheless, the natural sciences have managed, by and large and in the long run, to overcome individual biases by means of an institutionalized commitment to mutual disclosure and scrutiny, and by competition between partisans of rival approaches.

A popular stereotype sees "the scientist" as objective in the sense, not merely of being free of bias or prejudice, but as unemotional, unimaginative, stolid, a paradigmatically convergent thinker. Perhaps some scientists are like this; but not, thank goodness, all of them. "Thank goodness," because imagination is essential to successful scientific inquiry, and a passionate obsession with this or that problem, even a passionate

commitment to the truth of this or that elegant but as yet unsupported conjecture, or a passionate desire to best a rival, can contribute to the progress of science. Another stereotype, this time perhaps more philosophical than popular, sees "the scientist" as an essentially critical thinker, refusing to take anything on authority. A systematic commitment to testing, checking, and mutual disclosure and scrutiny *is* one of the things that has contributed to the success of natural-scientific inquiry; but this is, and must be, combined with the institutionalized authority of well-warranted results. Not that crossword entries once inked-in never have to be revised; but only by taking some for granted is it possible to isolate one variable at a time, or to tackle a new problem with the help of others' solutions to older problems.

The disasters of Soviet and Nazi science remind us how grossly inquiry can be distorted and hindered when scientists seek to make a case for politically desired conclusions rather than to find out how things really are. Less melodramatic, but still disturbing, among the other potential hindrances that come immediately to mind are the necessity to spend large amounts of time and energy on obtaining funds, and to impress whoever supplies them, in due course, with your success; dependence for resources on bodies with an interest in the results coming out this way rather than that, or in rivals being denied access to them; pressure to solve problems perceived as socially urgent rather than those most susceptible of solution in the present state of the field; a volume of publications so large as to impede rather than enable communication.

Inquiry is difficult and demanding, and we very often go wrong. Sometimes the problem is a failure of will; we don't really want to know badly enough to go to all the trouble of finding out, or we really don't want to know, and go to a lot of trouble not to find out. And even with the best will in the world, we often fail.

Not all scientific theories are well-supported by good evidence. Most get discarded as the evidence turns out against them; nearly all, at some stage of their careers, are only tenuously supported speculations; and doubtless some get accepted, even entrenched, on flimsy evidence. Nevertheless, the natural sciences have come up with deep, broad, and explanatory theories which are well anchored in experience and interlock surprisingly with each other; and, as plausibly filling in long, much-intersected crossword entries greatly improves the prospects of completing more of the puzzle, these successes have enabled further successes. Progress in the sciences is ragged and uneven, and each step, like each crossword entry, is fallible and revisable. But each genuine advance potentially enables others, as a robust crossword entry does—"nothing succeeds like success" is the phrase that comes to mind.

Earlier, I stressed the complicated interactions among individuals that enable division of scientific labor and pooling of scientific evidence. But of course science is a social enterprise in another sense as well: it is a social institution embedded in the larger society, both affecting and affected by other social institutions; subject to political and cultural forces, it both influences and is influenced by the beliefs and values of that larger society. Earlier, I stressed the ways in which the social character of natural-scientific inquiry has contributed to its success. But of course both the internal organization and the external environment of science may hinder, as well as enable, good, fruitful, inquiry.

It would be less than candid not to admit that this list does not encourage complacency about the present condition of science. Once, important scientific advances could be made with the help of a candle and a piece of string; but it seems scientists have made most of those advances. As science proceeds, more and more expensive equipment is needed to obtain more and more recherché observations; and the more science depends for resources on governments and large industrial concerns, the worse the danger of some of the hindrances listed. While scientific techniques and instruments grow ever more sophisticated, the mechanisms needed to sustain intellectual integrity are strained.

Where the social sciences are concerned, it isn't so easy to think of examples of discoveries analogous to plausibly filled-in, long, much-intersected, crossword entries, nor to be so sure that real progress has been made—it's no wonder that some people deny that the social "sciences" are really sciences at all. Social scientists' enthusiasm for the mathematical techniques and the cooperative and competitive inquiry that have helped the natural sciences to build on earlier successes has sometimes encouraged a kind of affected, mathematized, obscurity, and prematurely gregarious (or dogmatically factional) thinking. More immediately to the present point, where the social sciences are concerned some of the prejudices apt to get in the way of honest inquiry are political as well as professional. Where the physical sciences are concerned, given the manifest

irrelevance of sex, race, class, to the content of physical theory, the New Cynics' complaints of pervasive sexism, racism, classism, etc., seem far-fetched. But where the human and social sciences are concerned, given the manifest relevance of sex, race, or class to the content of some theories, political and professional preconceptions can come together, and the complaints seem only exaggerated.

Perhaps it is because the social sciences are especially susceptible to the influence of political prejudice and bias that sociologists of science seem especially susceptible to a dreadful argument ubiquitous among New Cynics—the "Passes-for Fallacy": what has passed for, i.e., what has been accepted by scientists as, known fact or objective evidence or honest inquiry, etc., has sometimes turned out to be no such thing; *therefore* the notions of known fact, objective evidence, honest inquiry etc., are ideological humbug. The premise is true; but the conclusion obviously doesn't follow. Indeed, this dreadful argument is not only fallacious, but also self-undermining: for if the conclusion were true, the premise could not be a known fact for which objective evidence had been discovered by honest inquiry. Dreadful as this argument is, however, it has played a significant role in encouraging the recent alliance of radical sociology of science with the New Cynicism.

As a result, many sociologists of science have been cool or even hostile not only towards mainstream philosophy of science, but also to science itself; and this has reinforced the disinclination already felt by some mainstream philosophers of science, and by scientists themselves, to take sociology of science seriously as a potential ally in the task of understanding the scientific enterprise. This unfortunate quarrel between epistemology and sociology has obscured the potential for a sensible sociology of science to contribute to our understanding of what arrangements encourage, and what discourage, good, thorough, honest inquiry, efficient communication of results, effective testing and criticism.

Since both scientism and anti-scientific attitudes have their roots in misunderstandings of the character and limits of scientific inquiry and scientific knowledge, up till now I have focused on epistemological issues. But I don't at all mean to deny the legitimacy or denigrate the importance of those difficult ethical, social, and political questions about the role of science in society: who should decide, and how, what research a government should fund? who should control, and how, the power for good and evil unleashed by scientific discoveries?

As this suggests, the vexed question of science and values *is* vexed, in part, because of its many ambiguities. Scientific inquiry is a kind of inquiry; so epistemological values, chief among them creativity and respect for evidence, are necessarily relevant—which is not to say that scientific inquiry always or inevitably exemplifies such values. But moral and political values are relevant too; it is legitimate to ask, for instance, whether some ways of obtaining evidence are morally unacceptable, or whether, and if so how, and by whom, access to and applications of potentially explosive scientific results should be controlled.

Some New Cynics suggest that the fact that scientific discoveries can be put to bad uses is a reason for doubting the *bona fides* of those discoveries; and some hint that those of us who believe that science has made many true discoveries, or even that there is such a thing as objective truth, reveal themselves to be morally deficient in some way. But it isn't enough to point out the obvious confusion, nor to protest the blatant moral one-up-personship. It is essential, also, to articulate sober answers to those difficult questions about the role of science in society: to point out, *inter alia*, that only by honest, thorough inquiry can we find out what means of achieving desired social changes would be effective. And, as always, it is essential to avoid the exaggerations of the scientistic party as well as the extravagances of the anti-science crowd: to point out, *inter alia*, that decisions about what ways of handling the power that scientific knowledge of the world gives us are wise or just, are not themselves technical questions that may responsibly be left to scientists alone to answer.

Notes

1. Rauch, Jonathan, *Kindly Inquisitors*, Chicago: University of Chicago Press, 1993, p.35.

2. Collins, Harry, "Stages in the Empirical Programme of Relativism," *Social Studies of Science*, 11 (1981): 3–10; Gergen, Kenneth, "Feminist Critique of Science and the Challenge of Social Epistemology," in Gergen, Mary, ed. *Feminist Thought and the Structure of Knowledge*, New York: New York University Press, 1988, 27–48; Hubbard, Ruth, "Some Thoughts About the Masculinity of the Natural Sciences," in Gergen, ed., *Feminist Thought and the Structure of Knowledge*, 1–15; Harding, Sandra, *The Science Question in Feminism*, Ithaca, NY: Cornell University Press, 1986; Latour, Bruno, *Science in Action: How to Follow Scientists and Engineers Through Society*, Cambridge: Harvard University Press, 1987; Fuller, Steve, *Philosophy, Rhetoric, and the End of Knowledge*, Madison, WI: University of Wisconsin Press, 1993; Rorty, Richard, "Science as Solidarity," in *The Rhetoric of the Human Sciences*, edited by John S. Nelson, Allan Megill, and Deidre McCloskey, Madison, WI: University of Wisconsin Press, 1987, 38–52; Fish, Stanley, "Professor Sokal's Bad Joke," *The New York Times*, 22 May, 1996, A23.

3. Chalmers, Alan, introduction to *What Is This Thing Called Science? An Assessment of the Nature and Status of Science and Its Methods*, Atlantic Highlands, NJ: Humanities Press, 1976, and Milton Keynes, U.K.: Open University Press, 1978. (I can't find this sentence in the third [1999] edition of the book.)

4. Theocharis, Theo, and M. Psimopoulos, "Where science has gone wrong," *Nature*, 329 (October, 1987): 595–98; Gross, Paul, and Norman Levitt, *Higher Superstition: The Academic Left and Its Quarrels with Science*, Baltimore: Johns Hopkins University Press, 1994; Perutz, Max, "A Pioneer Defended," review of Gerald Geison, *The Private Science of Louis Pasteur*, *New York Review of Books* (21 December 1995): 54–58; Glashow, Sheldon, "The Death of Science!?", in Elvee, Richard, ed., *The End of Science? Attack and Defense*, Lanham, MD: University Press of America, 1992, 23–32; Sokal, Alan "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity," *Social Text* 46–7 (spring-summer, 1996): 217–52; Weinberg, Steven, *Facing Up: Science and Its Cultural Adversaries*, Cambridge: Harvard University Press, 2001.

5. Fox, John, "The Ethnomethodology of Science," in Nola, Robert, ed., *Realism and Relativism in Science*, Dordrecht, the Netherlands: Kluwer, 1988, 59–80; Laudan, Larry, "The Pseudo-Science of Science?" (1981), in Laudan, *Beyond Positivism and Relativism: Theory, Method, and Evidence*, Boulder, CO: Westview, 1996, 183–209; Koertge, Noretta, "Wrestling With the Social Constructor," in Gross, Paul, Norman Levitt and Martin W. Lewis, eds., *The Flight from Science and Reason*, Annals of the New York Academy of Sciences, 775, 1996, and Baltimore: Johns Hopkins University Press, 1997, 266–73.

6. Giere, Ronald, "The Feminism Question in the Philosophy of Science," in Nelson, Jack, and Lynn Hankinson Nelson, eds, *Feminism, Science, and the Philosophy of Science*, Dordrecht, the Netherlands: Kluwer, 1996, 3–15.

7. Bridgman, Percy W., *Reflections of a Physicist* (1950), New York: Philosophical Library, 1955. □

Exposing Roger Patterson's 1967 Bigfoot Film Hoax

New revelations shed light on a world-famous, much-debated film supposedly showing a Bigfoot creature.

KAL K. KORFF and MICHAELA KOCIS

The most famous recording of an alleged Bigfoot is a short film shot in 1967. Filmed in Bluff Creek, California, it shows a large, manlike creature striding through a clearing. In many ways the veracity of the film is crucial; unlike many alleged Bigfoot photographs, the subject in the film cannot be a misidentification. Either the film is a hoax or it is an unknown, hairy giant. The film's authenticity has been hotly debated, both among the public and among Bigfoot researchers.

After nearly forty years of secrecy, the truth behind the world-famous Roger Patterson Bigfoot film has been revealed. The man who actually wore the costume and played the role of Bigfoot in the film has been located and

has made a full confession. Moreover, the husband and wife team who made and sold the Bigfoot costume that Patterson used to fake his movie have also confessed, and several other important eyewitnesses have come forth with corroborating evidence. In a new book, *The Making of Bigfoot: The Inside Story* (Prometheus Books, 2004), Seattle-based author Greg Long reveals details of the hoax, the result of a six-year investigation which also clandestinely involved author Kal Korff.

The Legend of the Patterson Film

According to Roger Patterson, who died of cancer in 1972, he and a companion, Bob Gimlin, were riding their horses on October 20, 1967, in Bluff Creek, California, when they suddenly encountered a Bigfoot. Not coincidentally, the two were in the area to "look for the creature" and were hoping to capture it on film with a movie camera rented specifically for the occasion. Patterson was in fact working on a motion-picture documentary about the subject.

According to Patterson, the two men were quietly riding, when he saw the creature and his horse suddenly "reared and fell over." After spotting the creature and having his horse fall on him, Patterson managed to regain his composure and pull out his 16 mm camera. He started filming while running toward the Bigfoot, steadied himself, and capped off sixty seconds as it walked away, glancing back at them over its right shoulder.

The two men then purportedly made plaster casts of the footprints left by the creature and raced to the post office to mail the film for immediate processing. The rest of the story is now history.

The Hoax Begins to Unravel

The first concrete sign that the Patterson film was a hoax surfaced when a man named Clyde Reinke claimed to have first-hand knowledge of the fraud as a former office manager for American National Enterprises (ANE), a now-defunct movie company that specialized in wildlife films.

Reinke claimed that Roger Patterson was on the company's payroll as a "wildlife photographer." According to Reinke, Patterson and ANE "cooked up" the scheme to fake the Bigfoot film. ANE's alleged plan was to use the film as a "loss leader" that would attract huge audiences into theaters to see the footage (sandwiched in between their other movies). "The Bigfoot film increased attendance tremendously," Reinke claimed on the Fox network's one-hour special, *World's Greatest Hoaxes: Secrets Finally Revealed.*

When the program aired on December 28, 1998, it caused a sensation. One individual who saw the special was Bob Heironimus, a recently retired laborer and the person who had worn the Bigfoot costume in the Patterson film.

After deciding to come forth, Bob Heironimus says, "I told him (Bob Gimlin), 'I don't give a damn, I'm telling the truth. I'm tired after thirty-seven years,' and he tells me, 'Well, don't mention my name.'"

According to Heironimus, it was Bob Gimlin who first asked him, at Patterson's request, to wear the Bigfoot costume and help fake the film. Patterson and Gimlin "explained to me they were going to sell the film, naturally, and make a fortune. They would give me a thousand dollars, and then as they made money they would give me some." Despite keeping his end of the bargain, he was never paid.

"It was in July or August of 1967. Gimlin told me that Roger was going to make a film, and they needed someone to wear a suit." Heironimus was twenty-six at the time, and says he "thought nothing of it." From his perspective, it was just a way to make some quick and easy money.

Heironimus claims that the Bigfoot costume was made of synthetic fur and bits of leather from a horse's hide. Patterson had added "breasts" to the chest of the Bigfoot creature. Heironimus also remembers that it contained football shoulder pads inside it to "bulk it up," and that the head piece was, in fact, a dressed-up football helmet that had a mask attached to the front of it with two slits to look through. "Because the eyeholes were a little more than an inch away from my face, it was hard to see in that mask."

After being fitted with the suit, Heironimus claims he was told to stand in one place and not move until Patterson gave him the signal to start walking. The first few frames of the Patterson film do indeed show the Bigfoot starting its walk from a standstill.

When the filming was complete, according to Heironimus, both Gimlin and Patterson helped him out of the costume. He had felt claustrophobic inside it, and had yelled, "Get me out of this damn thing!" and recalls that "[the headpiece] stunk very badly." Patterson then told Heironimus to take the film and mail it off for processing. The Bigfoot suit and the dressed-up helmet were then placed inside the trunk of Heironimus's mother's car, a blue 1967 Buick.

Corroborating Heironimus's Story

Bob Heironimus's mother Opal claims that while her son was still sleeping on the morning after he returned, she went to put crates of fruit into the trunk of her car. When she opened up the trunk, she was shocked to find what she at first thought was a dead animal. Upon closer examination, she realized that it was some sort of animal suit or costume. "After I saw it, I looked around to see if anyone was around 'cause I thought

Kal K. Korff is an internationally known analyst, author, investigative journalist, and researcher. The president and CEO of Critical Thinkers, Korff is the author of Spaceships of the Pleiades: The Billy Meier Story *and* The Roswell UFO Crash: What They Don't Want You to Know. *His next book,* Secret Wars: Defending Against Terrorist Plots *will be published by Prometheus Books later this year. Korff can be reached at kalkorff@kalkorff.com and has a Web site at www.kalkorff.com.*

Michaela Kocis is a radio broadcaster for Expresradio *and an investigative journalist for* Mlada Fronta DNES, *the Czech Republic's largest newspaper. Her e-mail address is mkocka@hotmail.com; her Web site is at www.michaelakocis.com. Kocis is the first journalist to write a definitive exposé article series on Greg Long's research, having been given exclusive access to the investigative team.*

maybe I might have to have help. . . . Then I discovered it was just a suit. But that head layin' there, you know, staring at me!"

Opal continued, "I went in the house, and my sister-in-law, Willa Smith, lived right up the street, and she came down—she was always down at my house two or three times a day—and so, when she got down, I said, 'I want to show you something.' I opened up the trunk and let her look." Opal remembers that Patterson and Gimlin came late that day and returned Chico, one of the horses they'd ridden. Afterwards, the Bigfoot suit was removed from the car, and she never saw it again. Its present whereabouts remain unknown.

Bob Heironimus's nephew, John Miller, was eight at the time and also recalls playing with the Bigfoot suit and putting on the headpiece. "I just remember they had the trunk open, and I remember looking in there, and, 'What's that!' and pickin' up and foolin' with it. And I can remember finding the head and, being a young kid, I just put it right on. It was hot. And it stunk. I can remember going up to their front porch and lookin' in the front window to see if somebody could see me. I was going to try and scare somebody." When asked what he thought of the claim that no human being can possibly walk the way the Patterson creature does, Miller replied, "I'll tell you what, if you ever watch that [Patterson] footage and watch him [Bob Heironimus] walk, and then you have him walk down the road, you'll see—they walk exactly the same. I always got a kick out of that."

Heironimus's two brothers, Mike and Howard, have also confirmed his story. Although neither sibling saw the actual costume, they distinctly remember learning of their brother's involvement around the time of the hoax. Howard Heironimus stated, "He [Patterson] said, 'Do you think your brother, Bob, can be the Bigfoot in this thing here?' And I said, 'I don't know.' I said, 'You'll have to ask him.' So, I seen him [Patterson] probably a week later.' I said, 'Well, did you ask Bob?' He said, 'No.' He said, 'I didn't get to talk to him, but I think he said Bob Gimlin asked him. But I'm not really sure, he said he talked to Bob Gimlin, but he said, anyhow, he had talked to Bob [Heironimus] and that Bob had agreed to it [wearing the suit]. I don't know whether Bob Gimlin asked him [Bob Heironimus] or whether Roger asked him, but he [Patterson] had talked to Bob Gimlin, too. But I was in this thing before Bob Gimlin." Moreover, several other people in the small town of Yakima have all vouched for Heironimus's story and can prove that they first heard of it shortly after the hoax was created.

Still other witnesses, such as Merle Warehime, recall seeing the Bigfoot suit, which floated around the Yakima area after the hoax. "I believe we were out in the Ahtanum [Valley] by that old church. We was sittin' there. We were about to go jeepin', and somebody had the thing. It was in a box there, you know. It was just in kind of a box in the back. I didn't pay that much attention to it." When asked if he was convinced that Heironimus played the role of Bigfoot in the Patterson hoax film, Warehime was adamant, "Oh, yes. Yeah. That's the way Bob walks. All you have to do is watch him walk across the floor, and you know."

These statements dispute the claims made by Bigfoot defenders that Heironimus is some sort of Johnny-come-lately trying to make a fast buck and garner media attention. The truth is, Bob Heironimus has never gone public with the details of his story until now and has never been paid any money for his involvement in the hoax, unlike Roger Patterson and Bob Gimlin.

The Bigfoot Prints

Another important eyewitness Greg Long discovered is Harvey Anderson, the former owner of a gun and camera store in Yakima. Anderson claims that Patterson came into his shop one day with a plaster cast of a footprint allegedly left by Bigfoot and sought to rent a camera and get advice on how to film such a creature in the wild. According to Anderson, Patterson claimed he had not only seen a Bigfoot, but that it had touched his car and had actually lifted up one end. Anderson decided to go along with the story: "I was kind of getting a kick out of it, but I realized that he was lying to me or having hallucinations about the thing that came out of the woods and picked up his car."

After talking briefly about his alleged encounter, Patterson unwrapped an alleged Bigfoot cast. Anderson immediately doubted the authenticity of the item. "I said to him, 'It looks like it's too narrow on the front part because it couldn't stand erect. Based on the description you've given me of this tall man or tall animal, you have to have it broader at the ball of the foot. 'Oh, no,' he said, 'he stands right up.' I said, 'Well, it doesn't appear to be correct. It looks to me like it should be wider on the front where the ball of the foot is. For the length of the foot, it won't work.' He [Patterson] said, 'Well, I can solve that problem. I'll take some more casts.'"

Three days later, Patterson returned to ask Anderson for input on his latest efforts, showing him new casts and asking, "What do you think of that?" Anderson replied, "That looks better. That looks proportionate." Anderson says, "See, I did not know the guy, did not know his intention. You have to realize that people came in and out of the store all the time. You don't know them. You just wait on them and service their needs. I thought he was pulling a joke on somebody."

Patterson then told Anderson, "I have to ask you never to say anything about this because I've done this for my wife because I'm dying of cancer. I want to leave something for my wife." "What the heck," Anderson says now, "If people will buy it, why not? People will buy anything. He was giving me this sob story about his health, and he wanted to leave something for his wife, and you know, I wasn't doing it [shooting a fake film]. I was just listening to his story. I really didn't pay that much attention to it. It wasn't important."

Additional eyewitness testimony that Patterson faked Bigfoot prints comes independently from Roger Patterson's brother-in-law Bruce Mondor: "Roger made the footprints, and he explained the whole damn thing to me. He showed me the big foot; it didn't have an arch in it. It had toes like it should have. . . . And I asked him . . . 'What do you do, you pick this up and slam it down?' It had to weigh twenty-five or thirty pounds. He said, 'Yeah, that's what I do.' I said, 'Then

Frame from the 1967 Bigfoot film; note the shape of the raised foot sole.

Footprint allegedly found at Bluff creek site.

what do you do there [in the impression on the ground]?' He said, 'I pour plaster of Paris in there.'"

The Bigfoot Costume

Long also uncovered Philip Morris, the man who actually made and sold a gorilla suit to Roger Patterson—the one later used (with modifications) in his famous film.

In 1967, about two months before the film was made, Morris received a telephone call from Patterson: "I was the only one who was making a gorilla suit like that at that time. I knew what my gorilla suit looked like. It was brown. In the fifties and sixties, I made my gorilla suits only in brown. . . . Patterson asked me if I had a realistic-looking gorilla suit. I immediately asked him if he was a carny [carnival worker]. He said, 'No, I'm a rodeo cowboy. We're just going to have some fun.'"

Morris recalls, "So I took one of my gorilla suits and shipped it to him. Parcel post, if I remember. It was a standard suit we sold to all our customers. Then, not long after he would have received the suit, I got a call from him. He said he had received the suit, and that it seemed okay, but, he said, 'I can see the zipper in the back.' I told him, 'Just brush the fur down over the zipper.' The fur on the suit was a material called Dynel. It was a nylon fiber, a popular material back then. It was used on lots of things, like plush toys, bathroom rugs, toilet seats. I bought it from my supplier in only two colors, black and brown. Then Roger wanted to know how to make the arms longer. I said, 'Find a shovel handle or a stick and slip it in the sleeves. Then attach the gloves to the stick.' That's how to extend the arms in a costume. You screw the gloves onto the stick. Then he said he wanted to make the shoulders more massive. I told him to go down to a local high school and get some old football pads—the coaches would probably be happy to get rid of some old, cracked ones—and put them in the shoulders."

Bob Heironimus has never met nor talked to Philip Morris, yet Heironimus distinctly recalled the presence of shoulder pads in the Bigfoot suit that Patterson had modified, a fact that Philip Morris could not have known. This revelation is yet more evidence that the Patterson film is a hoax, and that

Heironimus not only wore the suit but that Morris supplied it to Patterson.

Morris's wife and business partner, Amy, helped make the famed suit. "Roger called us a second time and he asked us to ship him some extra gorilla fur. So we sent him some excess Dynel that was lying around," she said.

Philip Morris picks up the story: "He wanted to know how to fix the eyes. He said, 'You can see the white of the skin, when he [his Bigfoot actor] looks through the eye holes.' I said, 'Well, take some black makeup and put it around the person's eyes, and also have him close his eyes and put the makeup on his eyelids. That should do it.' A couple of months later, October '67, I was watching TV, and this film is being shown, and I see my gorilla suit. 'That's my suit!' I yelled." His wife came in and, upon seeing the broadcast, agreed.

Today, Morris Costumes is the single largest manufacturer and supplier of costumes to Hollywood and to stores across the United States. Morris adds, "I'd say, looking at the [Patterson] Bigfoot [film] in one of the those TV productions, the guy who wore the suit must have had his clothes on because the suit was really tight on him." This was another important revelation that further proves the Patterson Bigfoot film is a hoax. Prior to Morris's comment for the record, Bob Heironimus, without Morris's knowledge, independently testified that he had, in fact, worn his clothes under the Bigfoot suit, and that it did indeed fit him rather tightly.

Morris stated that a six-foot-tall person could fit inside the suit. Bob Heironimus is slightly taller than six feet, and he was very muscular as a youth, especially in the shoulders, arms, thighs, and legs. Photographs taken of Heironimus in 1967 confirm this. Using a technique called photogrammetry, a study of the Bigfoot film done by the BBC calculated the height of the Bigfoot at just slightly over six feet.

When asked about the length of the latex feet that he supplied to Patterson along with the rest of the gorilla suit, Morris replied, "Oh, I'd say fourteen inches." Not surprisingly, the Bigfoot tracks Patterson later submitted as his evidence measured fourteen inches. Morris adds: "The heel [of the creature] is too square-looking. It's a dead giveaway. Those are definitely my feet that I sold Patterson,"

Regarding Bigfoot's gait, Morris states: "The Bigfoot researchers say that no human can walk that way in the film. Oh, yes they can! When you're wearing long clown's feet, you can't place the ball of your foot down first. You have to put your foot down flat. Otherwise, you'll stumble. Another thing, when you put on the gorilla head, you can only turn your head maybe a quarter of the way. And to look behind you, you've got to turn your head and your shoulders and your hips. Plus, the shoulder pads in the suit are in the way of the jaw. That's why the Bigfoot turns and looks the way he does in the film. He has to twist his entire upper body." [See also David Daegling and Daniel Schmitt's article "Bigfoot's Screen Test" in the May/June 1999 issue of SKEPTICAL INQUIRER.] Heironimus also confirmed that he had to turn his entire torso, instead of just his neck, because of how he was constrained in the suit.

"The Bigfoot thing just wasn't a big deal in my life," Morris now reflects. "In the 1980s, the film didn't have the momentum it had at first. I decided to start talking about it. In the last few years all these documentaries have come out. Most people by now know the film is a hoax, or they should know. We're at a point in the public's relationship with the Bigfoot story, it's time to tell my story. I've been thinking about the story for forty years."

"A couple of months later, October '67, I was watching TV, and this film is being shown, and I see my gorilla suit. 'That's my suit!' I yelled."

The Eye Has It

The Patterson film also contains additional evidence that validates Heironimus's claim. It was originally discovered by one of the authors (Korff) when analyzing a first-generation, color-corrected copy of the film that Roger Patterson's widow Patty herself supplied and was later shown in Fox's *World's Greatest Hoaxes*. The key can be found in the seconds that surround frame 352, the famous portion of the clip where the "creature" looks back over its right shoulder and stares briefly at the camera.

When enlarged and studied carefully in detail, the frames reveal a sudden burst of light on the right eye, which cannot be explained by normal sunlight reflecting off of an organic eye. Curiously, its left eye remains in shadow, even though there is nothing around the face to block the light. According to Heironimus, a cloth with two holes in it for him to see through was draped over the front of the football helmet at least one inch away from his own eyes. This explains why the left eye of the "creature" is in shadow, because it is obscured by the cloth. However, this does not explain the light that appears in the right eye.

What does explain this sudden flash is a secret about Bob Heironimus that only he and his closest friends are aware of: Heironimus's right eye is missing, and he wears a prosthetic, or glass, eye! It was this glass eye of his that reflected the bright sunlight. Detailed enlargements and enhancements of this area suggest that these reflections are consistent with what one would expect of a glass eye and are not the result of anything organic in nature.

Further evidence in the Patterson film also vindicates Heironimus's story. The alleged "fur line" of the creature that goes down its back is in the exact spot where both Heironimus and Morris claim the zipper is located. Remember, Morris distinctly told Patterson how to hide this zipper from view, advising him to comb down the fur on the suit with a brush. Sure enough, this Bigfoot, a wild creature presumably living in wilderness, is remarkably clean and carefully groomed. Also, in frame 61, the bottom of the Bigfoot's right foot is easily seen. Not only is the arch on the wrong side, indicating that Bigfoot has two left feet, but as this author (Korff) first pointed out in the Fox special, the shape of the feet do not match the casts from the tracks that were later recovered at the site.

Jeff Meldrum, an anthropologist at the University of Idaho, is a firm believer in the authenticity of the Patterson film. Meldrum is convinced that the tracks found at the site match the soles of the feet visible in the Patterson film.

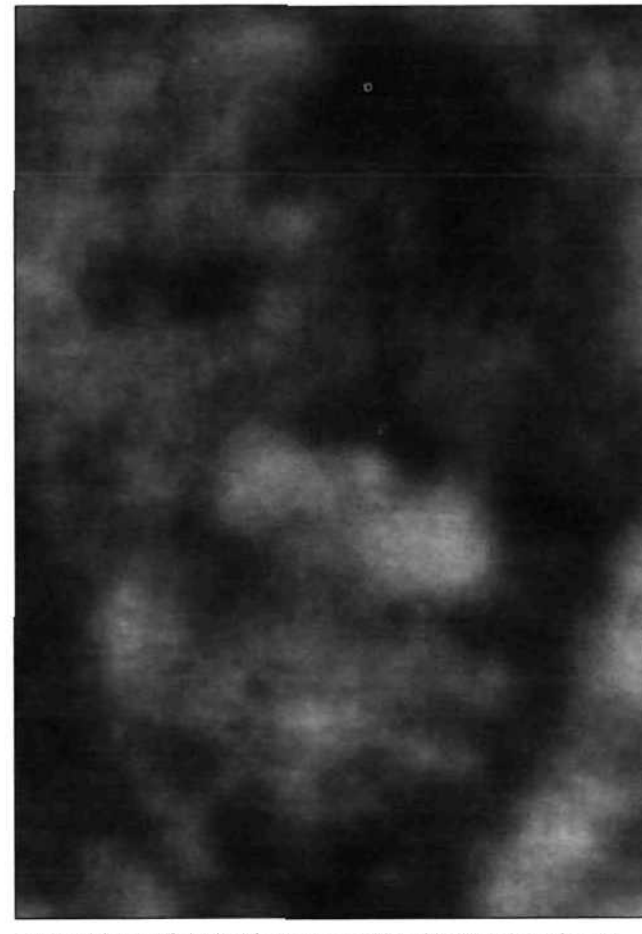
With all due respect to Meldrum's enthusiasm, evidence has yet to be presented that the prints that were purportedly left at the site match the bottoms of the feet of the creature. Morris's fourteen-inch "gorilla feet" are not physically capable of making the deep tracks that were later supposedly documented.

Conclusion

Since the publication of Long's book, the media reaction has been overwhelmingly positive. The mainstream press is no longer taking the Patterson Bigfoot film seriously as evidence of anything but a hoax. Sadly, the reaction by many Bigfoot researchers has been not only negative, but outright hostile. *Unable to disprove these damaging revelations, they have* resorted to everything from name calling and threats of violence and lawsuits to accusing everyone of being liars. Such behavior shows that when people cannot face facts, they tend to "shoot the messenger" instead of dealing responsibly with the truth.

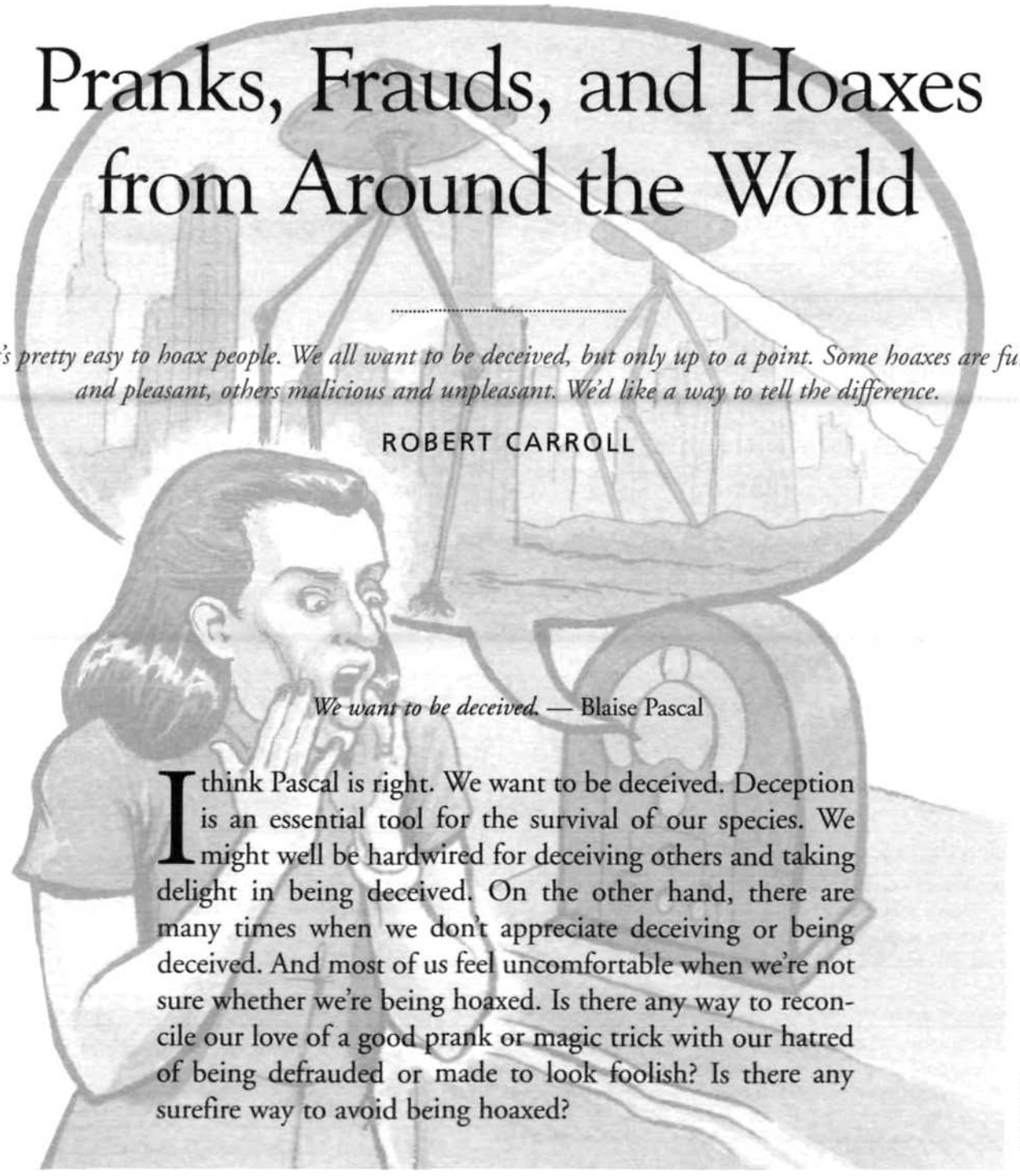
"This book was written for the general public, who have been misled over the years, not the Bigfoot community," explains Long. "They never bothered investigating Roger Patterson and his long trail of fraud very carefully. Their standards of 'evidence' are not what science demands. It's their problem to find a way to deal with all of this now, the media and the public are moving on with their lives. We must remember, there are still people on this Earth who believe that this planet is flat and not round." □

Frame showing the head and torso of the alleged Bigfoot.



Enlarged frame of the head; note the reflected light in the right eye.

Pranks, Frauds, and Hoaxes from Around the World



It's pretty easy to hoax people. We all want to be deceived, but only up to a point. Some hoaxes are fun and pleasant, others malicious and unpleasant. We'd like a way to tell the difference.

ROBERT CARROLL

We want to be deceived. — Blaise Pascal

I think Pascal is right. We want to be deceived. Deception is an essential tool for the survival of our species. We might well be hardwired for deceiving others and taking delight in being deceived. On the other hand, there are many times when we don't appreciate deceiving or being deceived. And most of us feel uncomfortable when we're not sure whether we're being hoaxed. Is there any way to reconcile our love of a good prank or magic trick with our hatred of being defrauded or made to look foolish? Is there any surefire way to avoid being hoaxed?

Gerald Fried

Maybe. Maybe not.

Most of us have been victims of pranks, hoaxes, or frauds. We may even have mistaken one for the other. For example, in April 2002, in Loomis, California, two teenagers got inspired by the MTV reality show *Jackass*. One of them videotaped his buddy as he ran along a rural road wearing handcuffs and an orange jail jumpsuit that he'd bought at a flea market. Unfortunately, some local citizens and law enforcement officers didn't know it was a prank, and they pursued the "escapee" with tracking dogs, patrol cars, and a helicopter. Folsom Prison ordered a full-scale lockdown and did a head count. They also did head counts at the jails in Placer and Sacramento counties, at some expense to the taxpayer.

It's sometimes hard to know whether something is a prank or a hoax or whether we're being defrauded. The jackass could well have been an escapee. If you saw someone in an orange jumpsuit and handcuffs running down the road and you didn't see the cameraman, your first thought probably would not be: "Ah, another *Jackass* prank."

Most of us have heard of the 1938 Halloween Eve radio broadcast by Orson Welles of an adaptation of H.G. Wells's *War of the Worlds* that many took to be an announcement that Earth had been invaded by Martians. Announcements that the story was fiction were made four times during the broadcast. Welles ended the show by announcing that the broadcast was a "holiday offering": "the Mercury Theater's own radio version of dressing up in a sheet and jumping out of a bush and shouting boo." The disclaimers did little to prevent many people from believing we'd been invaded by Martians. It's been called the hoax of the century, but it wasn't even a hoax. It wasn't a prank, either. It wasn't intended to fool people but to entertain them. Yet it fooled many people for several reasons.

1. It was presented realistically and authoritatively.
2. The story itself was credible at the time. There were flying machines, and the possibility of interplanetary travel was easily conceivable. It was not farfetched that some other race of beings might be more technologically advanced than we were.
3. Radio would have been the medium used to announce such an invasion.

Fooling the Experts

We can excuse ourselves, I think, for being taken in by some hoaxes because they're so believable. But others are so unbelievable, we have to wonder how anybody could fall for them. For example, how could Sir Arthur Conan Doyle, the creator of the Sherlock Holmes mysteries, have fallen for the Cottingley Fairy hoax? Two children, Frances and Elsie, photographed cutouts of fairies that shouldn't have fooled anybody. And how could the King's surgeon and the most famous obstetrician in eighteenth century England be duped into believing that the servant girl Mary Toft had given birth to rabbits?

Robert Carroll is co-chairman of the Philosophy Department at Sacramento City College in California and creator of the skeptical Web site www.skepdic.com and author of the book The Skeptic's Dictionary. *This article is based on his talk at the CSICOP conference on "Hoaxes, Myths, and Manias," Albuquerque, New Mexico, Oct. 23–26, 2003.*

How did the children and the servant fool such eminent men? It was easy: (1) The hoaxers put on a good game face. The kids didn't let on that they were making it all up—and we all know that children don't lie. Frances maintained until her death in 1986 that at least one of the photos was genuine. It wasn't until Elsie was a grandmother that she gave broad hints that the stunt was a hoax. And Mary Toft must have been a pretty fair actress as well. (2) The hoax fit with the beliefs of the eminent men. Doyle was a believer in the occult and paranormal, so the idea of fairies appearing to children and allowing themselves to be photographed did not strike him as obviously preposterous. He corresponded with Elsie and even wrote a book about the fairies (*The Coming of the Fairies*). The event was within the realm of the possible for him. And once Doyle gave his nod to the belief, others would follow.

The belief that a human could give birth to rabbits is a bit more complicated, yet the same principle applies. The medical establishment seemed to be willing to believe in this absurdity because of another false belief that was consistent with the rabbit-birth hypothesis: the theory of maternal impressions.

Maternal impressions is the notion, widely believed in eighteenth-century England, that a pregnant woman's experiences could be directly imprinted on her unborn child. The theory was used to explain birth defects. A child being born deaf was due to the mother having been shocked by a loud sound during pregnancy. If a pregnant woman looked at a blind person her baby might be born blind. Toft, who had been pregnant but miscarried, claimed to have had an intense craving for roast rabbit. She said she admired rabbits, dreamed about them, and spent time trying to catch them. Thus, her claim of giving birth to rabbits fit with the notion of maternal impressions and didn't seem absurd to the local doctor, the King's surgeon, or a famous obstetrician, and with their support for the claim Mary's hoax took root.

Now, I may not have fallen for any *whoppers* lately—to use Marvin Minsky's description for unbelievable beliefs—like the Cottingley Fairy or the Rabbit Birth hoaxes, but I've been hoaxed more times than I care to remember (actually given the state of my memory, more times than I can *hope* to remember).

For example, I was once hoaxed by my online editor John Renish, who sent me a link to a Web site with the cryptic note "I do like the part about how women are different from men." I looked at the Web site (at http://objective.jesussave.us/creationsciencefair.html) and it claims to be a report on the Fellowship Baptist Creation Science Fair 2001. I went right to the part about how women are different from men and found an essay that supposedly won second place in the Middle School Division called "Women Were Designed for Homemaking" by Jonathan Goode (grade 7):

- physics shows that women have a lower center of gravity than men, making them more suited to carrying groceries and laundry baskets;
- biology shows that women were designed to carry unborn babies in their wombs and to feed born babies milk, making them the natural choice for child rearing;
- social sciences show that the wages for women workers are lower than for normal workers, meaning that they are unable

to work as well and thus earn equal pay;
- and, exegetics shows that God created Eve as a companion for Adam, not as a coworker.

Given other things I believe about fundamentalist creationists, it was not outside the bounds of credibility for me that some poor kid might actually believe this stuff and be encouraged to believe it by his elders.

The caption under the first-prize winner's picture reads, "Patricia Lewis displays her jar of non-living material, still non-living after three weeks."

Even the notion that such an experiment would be thought relevant to the belief that life doesn't come from non-life isn't that farfetched when you consider some of the other things some creationists teach their children.

But if you dig around a bit on the Web site, there are some giveaways that this site is an elaborate hoax, such as the advice to dress up like John the Baptist on Halloween and scare kids when they come trick-or-treating before sending them off with no candy and a Bible tract. Somebody (actually a man named Chris Harper) had gone to an awful lot of trouble to make fundamentalist Christians look very silly.

Being hoaxed by my editor reminded me that it is people you trust who can most easily mislead you, because you let your guard down and aren't critical enough. If you're trying to avoid being hoaxed, here's lesson number one: *Don't trust people you trust!*

Whoppers

I think it goes without saying that *anybody* can be hoaxed. Nobody is exempt. Even famous newscasters can be duped. Tom Brokaw and many others were hoaxed by David Rorvik in 1978 when Rorvik claimed he had proof of human cloning. Twenty-five years later we saw the same hoax perpetrated by the Raelian Bishop Brigitte Boisselier, who claimed a group she headed called Clonaid had cloned five humans and that proof would be forthcoming. (That's *proof*, not *truth*, that would be forthcoming.) The leader of the group, Rael, was a race-car driver and sports journalist who was known as Claud Vorilhon until he was picked up by aliens near a volcano in France, taken to a planet in the Pleiades, and sent back to start a UFO cult. He says the cloning hoax was worth millions in publicity. Who could doubt him?

The idea of a human cloning is not as farfetched today as it was twenty-five years ago. Human cloning doesn't deserve to be categorized in the *whopper* class of beliefs. The whoppers are ones we should recognize immediately as 99.99 percent likely to be hoaxes. The hoaxes I'm going to go over with you now I think are of the whopper variety.

For example, there's the Indian Rope Trick. How could any rational person believe such a story, which, on its face, is as absurd as that of a woman giving birth to rabbits? This alleged trick involves an Indian fakir who throws a rope to the sky, but the rope does not fall back to the ground. Instead it mysteriously rises until the top of it disappears into thin air. A young boy climbs the unsupported rope, which miraculously supports him until he also disappears into thin air. The fakir then pulls out a knife and climbs the rope until he, too, disappears. Body parts fall from the sky into a basket next to the base of the rope. The fakir then slides down the rope, empties the basket, throws a cloth over the scattered body parts, and the boy miraculously reappears with all his parts in the right places. Thousands of people claim to have witnessed this trick that never happened.

Actually, the only thing needed for this trick is human gullibility. According to Peter Lamont, a researcher at the University of Edinburgh and a former president of the Magic Circle in Edinburgh, the Indian Rope Trick was a hoax played by the *Chicago Tribune* in 1890. Lamont claims the newspaper was trying to increase circulation by publishing this ridiculous story as if there were eyewitnesses to the event. The *Tribune* admitted the hoax some four months later, expressing some astonishment that so many people believed it was a true story. After all, they reasoned, the byline was "Fred S. Ellmore." They hadn't reckoned that their audience, many of whom believe in magicians with miraculous powers, wouldn't find this story that hard to accept.

Our next hoax is about an event that really did happen in India. Ramar Pillai astounded the world when he announced that he could change water into diesel fuel. He claimed he had some magic herbs that, when added to boiling water, could produce a virtually pollution-free diesel fuel or kerosene for about twenty-three cents a gallon—not quite as impressive as Pons and Fleishmann's cold-fusion claim, but impressive nonetheless. Pillai was promoted on the Internet as the new Isaac Newton. To produce his fuel, Pillai cooked leaves and bark from a special plant for about ten minutes in hot water. He stirred the mixture and let it cool down. The liquid fuel would float to the top and be separated by filtering. The entire process took less than thirty minutes.

His fuel was allegedly tested at the Indian Institute of Technology and was shown to be a pure hydrocarbon similar to kerosene and diesel fuel. Engineers conducted tests and concluded that the herbal fuel offered better fuel economy than gasoline. One scientist tried to explain the magic by offering the theory that atmospheric carbon dioxide might be sucked in during the reaction. The carbon dioxide combines with hydrogen liberated from water and forms the hydrocarbon fuel. A better explanation seems to be that Pillai's stirring stick is filled with fuel and when his mixture is heated up, a wax plug at the end of the stick melts, liberating the fuel. Pillai, it seems, was part of gang who hoped to trick people into buying fuel they'd stolen from Indian oil companies. Pillai was very convincing in his role as a peasant-genius. I remember reading one news account in which he described how he'd been kidnapped and tortured by a gang trying to wrest from him his secret recipe. He described how he'd been hung from a ceiling fan and burned with cigarettes. Poor fellow.

Cabrera's Stones

Next, we go to Peru and Dr. Javier Cabrera's stones. Dr. Cabrera gave up his medical practice in 1996 to open a museum for some stones he bought from a local farmer that depict stylized men who look like ancient Incas or Aztecs.

What is unique about these stones is that they depict activities such as astronomy and surgery, indicating a very advanced civilization. Furthermore, there are also stones that are said to show extinct fish and humans riding dinosaurs. The stones are said to provide evidence that the ancient locals not only had an advanced civilization, but they lived at the time of the dinosaurs. The stones call into question just about everything science has taught us about the origin of our planet, ourselves, and other species. The farmer who sold Dr. Cabrera the stones at first claimed that he had found them in a cave, but later admitted that he made them himself to sell to tourists.

Even though this hoax was created for a tourist trade, there are three groups in particular who have endeavored to support the authenticity of the stones: (1) the followers of Erich von Däniken (author of *Chariots of the Gods?*) and those who believe that extraterrestrials are an intimate part of Earth's "real" history and were the ones who brought advanced civilization to the ancient Indians; (2) fundamentalist creationists who drool at the thought of any possible error made by anthropologists, archaeologists, or evolutionary biologists, and who relish the thought of evidence that humans, dinosaurs, and extinct fish lived together a few thousand years ago; and (3) the mytho-historians, followers of Immanuel Velikovsky or Zecharia Sitchin who claim that ancient myths are accurate historical records to be understood literally.

Any rational person examining all the evidence should conclude that the probability is about zero that these stones are evidence of extraterrestrials or the validity of ancient myths or proof that men lived with dinosaurs. But if you already believe that extraterrestrials have been among us for millennia, then you may well find the extraterrestrial account plausible or even probable. Likewise, if you believe that Earth is only a few thousand years old and are well-versed in Flintstone science, then the idea that these stones depict actual events may well be believable to you.

The Visions of Catalina Rivas

Catalina Rivas of Cochabamba, Bolivia, was a "fallen-away Catholic" until 1993, when she went to see a woman named Nancy Fowler. Fowler is from Conyers, Georgia, and for several years claimed that the Virgin Mary appeared to her on the thirteenth of each month (à la Fatima). Rivas claims she went to Conyers and had her first stigmatic experience there. You may have seen Rivas in the July 1999 Fox television special "Signs from God: Science Tests Faith." A more apt title would have been: "Dollar Signs: Fox Tests Gullibility." In that program, reporters Giselle Fernandez and Michael Willesee took viewers on an uncritical tour to "scientifically" examine weeping and bleeding statues, rose petals with "miraculous" images of Jesus and Mary, and the stigmata of Katya Rivas, among other things.

Rivas is hailed by her thousands of admirers as the spiritual mother of not one but two international religious movements, The Great Crusade of Love and Mercy and the Apostolate of the New Evangelization. In 1996, she claimed she was getting messages from God, not only in Spanish but also in Greek, Latin, and Polish. These allegedly divine messages were photocopied and sold at religious rallies. Her bishop, René Fernández Apaza, authenticated both her stigmata and her messages from God.

On June 22, 2001, I received an e-mail from a man named José H. Prado Flores, who told me that he was "a writer of books oriented to forming leaders in the Catholic Church." Several years ago, he wrote, he had co-authored a book with Salvador Gómez called *Formacion de Pedicadores* ("Training Preachers") and that Katya Rivas had rewritten their book as "messages from Jesus *'dictada a la sierva de Dios'* ('dictated to God's servant')." He told me that when Rivas, "the famous 'visionary and stigmatic'" was scheduled to appear at a religious rally in Guadalajara, Mexico, where Prado Flores lives, a friend showed him a set of books that were to be sold during the convention. "You can understand my total amazement," he wrote, "when I put two and two together and figured out she was the same lady that had 'stolen' my book. We then went to the bishop of Guadalajara, Juan Cardenal Sandoval Iñiguez, who, after seeing our study on her material, immediately cancelled her participation."

Why, you might wonder, would a Catholic author contact an atheist who is skeptical of all things miraculous about this matter? José had read my rather unflattering review (at www.skepdic.com /refuge/bunk9.html#stigmata) of the Fox special, and said he wanted any information I might have that would help prove that Rivas "is a compulsive and professional liar."

For over a year and a half, I exchanged e-mails with José and his wife Susan about Catalina Rivas. I obtained copies of his book and copies of her messages. I established that he and Salvador Gómez had written hundreds of pages that are nearly identical to the material being published by Rivas, and that the pair of Mexican authors had written some of the material at least sixteen years before Katya's "messages." My edition of *Formacion de Predicadores* is dated 1992, four years before her messages, which have page after page of nearly verbatim plagiarizing.

To her followers who ask me how it is possible for a peasant woman with no formal education to write books in Spanish, Polish, Greek, and Latin, I say it is simple: *she copies them.* It seems obvious that she did it for her Spanish messages from Jesus, and I suspect that if the Bishop who authenticated her stigmata would have put a little more energy into authenticating her messages, he would find the same is true for her works in other languages as well.

Channeling Dr. Fritz

Another whopper began with Zé Arigó (1918–1971), a Brazilian faith healer who, in the early 1950s, claimed to channel the spirit and healing power of Dr. Adolf Fritz, a German doctor who allegedly died during World War I. Arigo developed quite a reputation as a faith healer and psychic surgeon, but his ploy seemed to have been aimed at directing business toward his brother, a pharmacist. He would write out illegible prescriptions for people that only his brother could read. People came from far and wide to be cured by Arigo. His reputation soared after it was alleged that he did a bit of psychic

surgery and removed a cancerous tumor from the lung of a well-known Brazilian senator. For twenty years, Arigó's fame spread as he "cured" and "operated" on thousands of people, including the daughter of Brazil's president. Despite his fame, he was twice convicted of practicing medicine illegally.

Arigo performed his psychic surgery with a pocketknife and a heavy German accent, perhaps to misdirect people so they wouldn't notice his lack of concern for medical hygiene.

Arigo died in a car crash in 1971, but Dr. Fritz didn't go with him. He took over the body of another Brazilian healer who went by the name of Oscar Wilde. (I'm not making this up.) Wilde didn't last too long before he, too, died a violent death. After that, a gynecologist from Recife, Dr. Edson Queiroz, claimed Dr. Fritz was his. The doctor, however, was stabbed to death in 1991.

The current channeler of Dr. Fritz is engineer Rubens Farias Jr., who heals the astral body with energy healing and does some psychic surgery with unconventional instruments such as scissors. Farias is also unique in that he claimed Dr. Fritz came to him in 1986, while Dr. Queiroz was still alive. I had to consult Thomas Aquinas to see whether it is possible for the same spirit to appear in two bodies simultaneously; it turns out spirits don't occupy space so they can be everywhere at once. Anyway, despite the dual channeling and the fact that he has also been accused of practicing medicine without a license, Farias has endless lines of people with faith in miraculous cures waiting for a bit of his magic.

Exposing the Hoaxes

Some skeptics suggest that the best way to undermine such faith and enlighten people is to demonstrate how easy it is to fake the paranormal and the supernatural. I'm not so sure. I think we could expose dozens of fake healers, but it would not make it any easier to expose the next one who comes along because we wouldn't be destroying the underlying belief system that is needed to make the faith healer plausible. I believe this partly due to what happened with a fake psychic and a fake channeler who were sent to Australia to enlighten the people.

In 1986, Mark Plummer, former president of the Australian Skeptics and former Executive Director of CSICOP, and Dick Smith, a patron of the Australian Skeptics, invited magician and mentalist Bob Steiner to come to Australia to perform as a psychic. Steiner often pretends he is an astrologer, tarot card reader, palm reader, or a psychic. After his performances he reveals that he is not psychic but uses trickery and deceit to fake paranormal powers.

For two weeks, Steiner hoaxed Australia as Steve Terbot. He appeared on television programs, gave performances at cultural centers, and in a very short time became a hit. He appeared on *Tonight with Bert Newton* (similar to *The Tonight Show*) three times and in his last appearance revealed the hoax, explaining that he used cold-reading techniques and other tricks to deceive people into thinking he was psychic. The purpose of the hoax was to "warn the people of Australia to beware of people claiming to be psychics." Plummer and Smith had brought Steiner to Australia because of a fairly large influx of foreign psychics who were being welcomed and accepted with incredible credulity by the natives. They hoped that once the people saw how easy it is to fake being psychic, they would see the error of their ways.

Did it work? According to Steiner, it worked extremely well and effectively put an end to the influx of foreign psychics. Mark Plummer agreed. Here's what he told me in a recent e-mail message when I asked him whether he thought the hoax did any good:

> Yes. Before then Australia was regularly visited by "internationally known" psychics. Since then we have only had a couple. Also the organisers are terrified that if they promote someone that person will turn out to be a skeptic.
>
> To put it in a wider international context: Before, there were skeptics groups in most countries [but] individuals had no easy way of checking up on the claims of "international psychics." Once CSICOP could act as a central library and clearing house and the national skeptics groups started talking to each other it became much harder for such charlatans to operate internationally. Then, with the invention of the fax and the Internet, the exchange of skeptical information has become much easier.

Steiner also exposed a man named John Fitzsimons as a fraud, paving the way for a $64,000 judgment on behalf of one of Fitzsimons's clients. Seventeen years later, however, I found Fitzsimons on the Internet. He runs a New Age group called Aspects in a small town outside of Melbourne. He leads discussions on topics such as past lives, karma, out-of-body experiences, spirit guides, prayer, healing, White Eagle (a channeled being), multiple personality disorder, mediumship, cults, night terrors, spiritualism, psychic readings, exorcism, Ouija, channeling, Seth, aliens, Atlantis, UFOs, and chronic fatigue syndrome. In short, Steiner was about as successful in putting away Mr. Fitzsimons as he and Randi were in putting away Peter Popoff, the faith healer they exposed as a fraud in 1986.

Speaking of the Amazing Randi, a tour of world hoaxes would not be complete without a discussion of the "Carlos" hoax. According to Randi, in 1988, channeling was the rage in Australia, and an Australian television program contacted him about finding someone who might go down under and pretend to be a channeler. The plan was similar to the Steve Terbot hoax. This time, José Alvarez would channel an ancient spirit he called Carlos. Alvarez would tour Australia, appear on TV, and appear in various venues, including the Sydney Opera House. At the end of a few weeks, the hoax would be revealed. Again, the purpose was to enlighten Australians by demonstrating how easy it is to fake channeling. Like Steiner, Alvarez was very convincing and he had a large following in a very short time. And, in the end, everything was revealed.

Did the hoax work? Was anybody enlightened? I was able to discuss this question at length with both Alvarez and Randi while at the JREF Amazing Meeting in February 2003. Both think the hoax accomplished its mission. In fact, Alvarez continues to take Carlos on the road in an effort to enlighten people with what he calls "performance art."

What was most revealing about both the Steve Terbot and Carlos hoaxes was how the media didn't bother to check their

credentials or their claims about themselves. The media took it for granted they were who they said they were and did what they said they did. Looking to the media for protection against being hoaxed is probably an exercise in futility. So, here is valuable lesson number two: *Don't expect help from the mass media.*

Nevertheless, I sought the opinion of someone in the Australian media and asked him if he thought there were any benefits or long-term effects of either the Steve Terbot or the Carlos hoaxes. I tried to contact Phillip Adams, a well known Australian journalist, writer, and media personality. Adams wasn't directly involved with either hoax. In fact, he was writing scathing articles condemning the phony psychics plaguing the land during the time Bob Steiner was gathering his flock as psychic Steve Terbot. Adams was out in the bush or someplace where they don't have e-mail when I tried to contact him, but his assistant, Amanda Bilson, got in touch with him and relayed this message:

> . . . he asked me to pass on a couple of comments to you. First of all he wasn't involved with the Randi/Terbot hoax[es] and is not convinced [they were] entirely successful. Perhaps the media learned to be a little more sceptical—but they soon returned to their old standards of gullibility. And many people blame the messenger for the message, turning their anger on the Sceptics rather than the charlatans. He thought [they were] great fun but, given the attention span of public and media alike, of little long term significance.

Recently, Michael Shermer, of the Skeptic Society, discovered the same thing: It's easy to hoax people and it's great fun, but rather than enlighten people, it seems that you just anger some of them. Shermer used the cold-reading techniques described by Ian Rowland in his book *The Full Facts Book of Cold Reading* and pretended to be a tarot card reader, a palmist, an astrologer, a psychic, and a medium who could get messages from the dead. He did this on camera with five strangers who did not know who he was or what he was doing. He seems to have been pretty successful in convincing his clients of his paranormal powers. However, when he revealed to them that the whole thing was a hoax, two were so upset that they refused to sign a release to use the material in the show he was filming. Three of his subjects were college students who seemed less concerned about being duped than in finding out when they would be on TV. If any of them thanked Shermer for helping them see the truth about the paranormal, he didn't mention it.

So what can we learn from all this? Well, it's pretty easy to hoax people. Pascal is right: We want to be deceived, and that makes it easy to hoax us. Also, many of us already have beliefs that make us vulnerable to being hoaxed about certain kinds of things. Furthermore, most of us enjoy being deceived by a good magician or by someone pulling off a non-malicious prank or hoax.

But we don't *always* want to be deceived. We don't want to be made to look like idiots or be led into believing something foolish. Nor do we ever wish to be defrauded. And most of us don't like that uncomfortable feeling that rises in us when we're not sure whether we're being hoaxed. We know some hoaxes are benevolent and pleasant, while others are malicious and unpleasant. Ideally, we'd like a surefire way to tell the difference so we'd never be hoaxed against our will.

We know some hoaxes are benevolent and pleasant, while others are malicious and unpleasant. Ideally, we'd like a surefire way to tell the difference so we'd never be hoaxed against our will.

That's why I wrote the book *Don't Get Hoaxed*, in which I explain such things as the *hoax-prone personality*: the person who is trusting and honest; attracted to attractive people; believes the believable and the unbelievable; and lacks a good understanding of confirmation bias and cold-reading techniques.

I also reveal that if you map out the locations of the world's greatest hoaxes, you will find that they lay along ley lines that, when connected by a line to the north star at the vernal equinox, form a pyramid with the exact proportions as the Great Pyramid of Giza.

Coincidence? I don't think so.

Trust me, I teach ethics.

References

Carroll, Robert Todd. 2003. *The Skeptic's Dictionary: A Collection of Strange Beliefs, Amusing Deceptions, and Dangerous Delusions.* Hoboken, New Jersey: John Wiley & Sons. Also online at www.SkepDic.com.

Levine, Robert. 2003. *The Power of Persuasion: How We're Bought and Sold.* Hoboken, New Jersey: John Wiley & Sons.

Pickover, Clifford A. 2000. *The Girl Who Gave Birth to Rabbits: A True Medical Mystery.* Buffalo, New York: Prometheus Books.

Polidoro, Massimo. 2002. Ica stones: Yabba-dabba do! SKEPTICAL INQUIRER 26(5): September/October.

Randi, James. 1989. *The Faith Healers.* Buffalo, New York: Prometheus Books.

———. 1982. *Flim-Flam! Psychics, ESP, Unicorns, and Other Delusions.* Buffalo, New York: Prometheus Books.

Rowland, Ian. 2002. *The Full Facts Book of Cold Reading.* 3rd ed. London: Ian Rowland Limited.

Shermer, Michael. 2003. Psychic for a day, or how I learned tarot cards, palm reading, astrology, and mediumship in 24 hours. *Skeptic* 10(1): 48–55.

Stein, Gordon. 1995. *Hoaxes!: Dupes, Dodges & Other Dastardly Deceptions.* Canton, Michigan: Visible Ink Press.

Steiner, Robert A. 1989. *Don't Get Taken!—Bunco and Bunkum Exposed: How to Protect Yourself.* El Cerito, California: Wide-Awake Books.

Web sites

- http://www.augustachronicle.com/stories/041102/biz_UE0007-0.shtml ("Woman gives birth to rabbits! Or so they said . . . ," by Michael Woods, *The Augusta Chronicle*, April 11, 2002).
- http://home.vicnet.net.au/~johnf/biogjfit.htm (John Fitzsimons). □

Seeing the World Through Rose-colored Glasses

Scotopic Sensitivity/Irlen Syndrome

Helen Irlen and her followers claim that dyslexia, attention deficit hyperactivity disorder, and autism are all associated with "Scotopic Sensitivity Syndrome," and each can be effectively treated using colored lenses and overlays. The scientific evidence suggests otherwise.

ALAN D. BOWD and JULIA O'SULLIVAN

More than four thousand American schools have implemented a controversial approach claimed to assist children with reading difficulties sometimes known as dyslexia (Robinson 2003) and other disabilities, including autism. The Irlen method, named for its founder Helen Irlen, involves the use of colored lenses or overlays, which she argues improve reading skills, memory, and depth perception, as well as helping persons with learning disabilities and autism learn better. More than eighty thousand Americans, most of them children, have bought Irlen "filters" (Robinson 2003) despite a complete absence of scientific evidence for the existence of "Scotopic Sensitivity Syndrome," which the filters supposedly treat. The story of

Helen Irlen and her "Irlen Institute" seems like a case study in educational flimflam.

A school psychologist, Helen Irlen unveiled her theory of Scotopic Sensitivity Syndrome (also styled "Irlen Syndrome") at the 1983 annual convention of the American Psychological Association. Her short paper, based on a sample of thirty-seven learning-disabled adults, claimed that most had reading difficulties because of visual perception problems. After a month of wearing "photopic transmittance lenses," later known as "Irlen filters," most subjects reported improved depth perception, reading speed, and reading comprehension. There was no control group, and the self-report technique used maximized a likely placebo effect. Nevertheless, Irlen claimed to have discovered the existence of "a previously unrecognized perceptual dysfunction" that her filters were able to treat effectively (Irlen 1983). She later claimed that Scotopic Sensitivity Syndrome (SSS) affects "up to 12%" of the general population and "a much higher percentage" of individuals with dyslexia, learning disabilities, attention deficit hyperactivity disorder (ADHD), and autism (Irlen 2000), although no evidence for these claims was offered.

Scotopic Sensitivity Syndrome

Just what is SSS? Writing in *Latitudes* magazine, Irlen (2000) claimed SSS is a visual-perceptual processing deficit, and that since there are no educational or medical tests to identify it, SSS is often mislabeled as learning disability or ADHD. However, she has never offered a formal definition of SSS.

In 1991 Irlen published *Reading By the Colors: Overcoming Dyslexia and Other Reading Disabilities Through the Irlen Method.* This self-help book was directed at the public to sell her products. Irlen's lenses and overlays, her "standardized" tests, self-report inventories, and checklists are all available at a price, and it is repeatedly implied that most children with reading difficulties can benefit from Irlen's screening and diagnostic procedures, available from trained "screeners." An appendix lists addresses and telephone numbers for Irlen Clinics in the U.S. and five other countries.

The closest that Irlen has come to defining SSS is the following simplistic speculation in *Reading By the Colors:* "Scotopic Sensitivity Syndrome—and the sensitivity to full-spectrum light that forms the basis of the syndrome—possibly involves a structural brain deficit involving the central nervous system. If so, then signals sent to the brain would be inappropriately processed, resulting in perceptual problems. For those with SSS, full-spectrum light would distort what is perceived and processed by the brain" (57).

She went on to suggest that if certain wavelengths were reduced by colored filters, the brain would be able to "more effectively analyze and process information without interference" (57).

The book begins with a "self-test" in which the reader, or "someone you know" (your child, perhaps?) is presented with fourteen questions about reading difficulties. Those who respond positively to three or more may very well have SSS. The "symptoms" presented are so general and common it is likely that very many people would qualify. They include skipping words, rereading lines, losing place, taking breaks often, and reading close to the page. The test, for which no evidence of validity or reliability is presented, represents a clever hook to get the reader involved. The book has become a best seller.

Getting the Message Out

Reading By the Colors is a classic self-help book. It offers good news: the promise of an effective treatment for children with learning disabilities, particularly dyslexia. Irlen invents a syndrome, provides a simple, noninvasive way of ameliorating its effects, and holds out hope to the parents of children with learning disabilities. She also claims that her approach will help a wide range of exceptional youngsters who have visual and auditory perceptual disabilities, memory and motor problems, and attention deficit hyperactivity disorder. A brochure from the Irlen Institute titled "Understanding Scotopic Sensitivity Syndrome" (Irlen Institute 1990) also lists general characteristics of children's writing, mathematics performance, musical ability, depth perception, and gross motor skills that supposedly may be symptoms of SSS. These include mistakes in writing when copying, in mathematics ("sloppy, careless errors"), playing music better by ear than from sheet music, and difficulty catching balls. (Autism was added to this list later.) With no indication of the age-appropriateness of these criteria, these characteristics fit nearly every youngster at one time or another. In case the reader may consider seeking advice elsewhere, the brochure points out that SSS cannot be detected by regular optometric, medical, psychological, or educational testing.

Irlen likes to associate her Institute, located in Long Beach, California, with universities, and the annual Irlen conferences are usually held at a prestigious campus. In her book, she writes that after an appearance on *60 Minutes,* Dr. Paul Whiting[1] returned to Australia to open the first SSS clinic "at Sydney University." Sydney is Alan D. Bowd's alma mater, and on a recent trip there he decided to visit the Irlen clinic. It had been located in rented premises on campus and had since moved. He spoke with the director, who confirmed that the clinic had no relationship with the university.

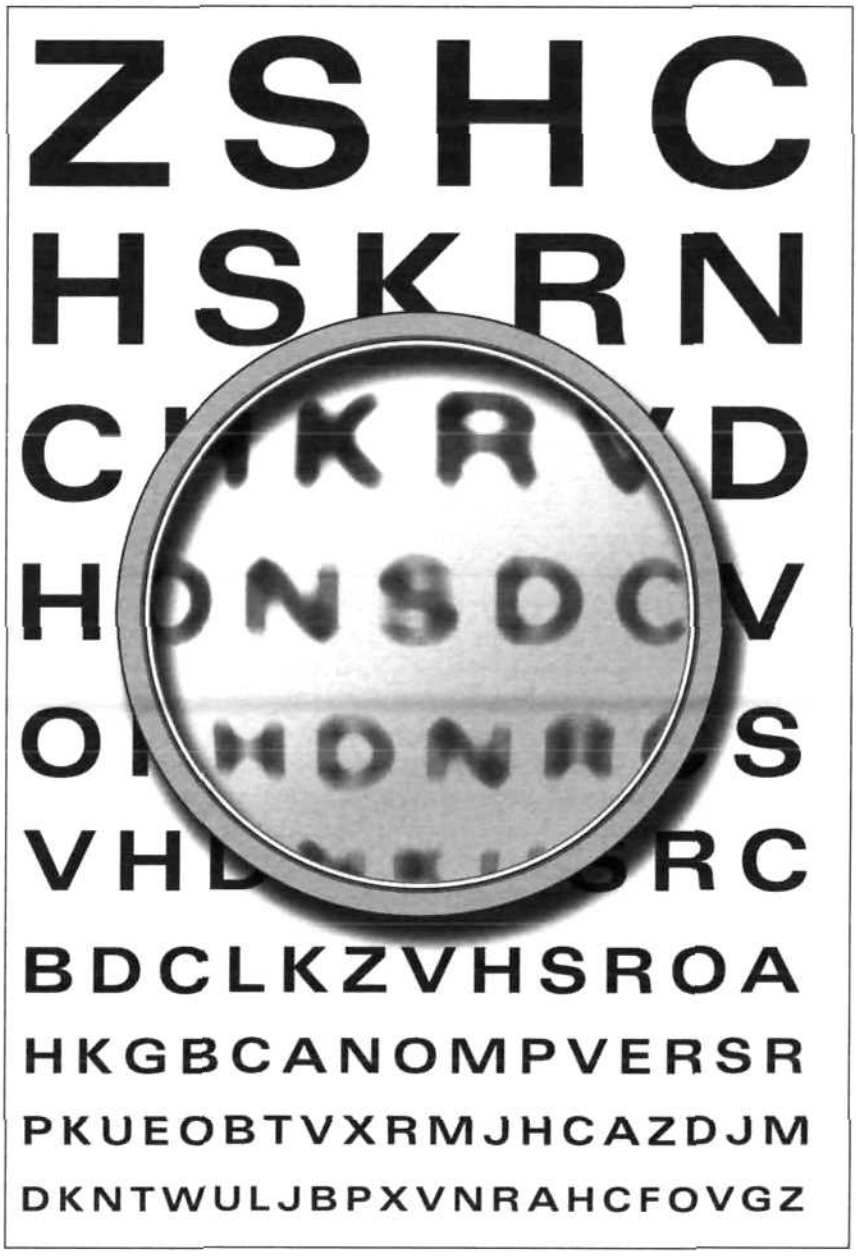
The Irlen Institute, like nearly all questionable or "alternative" approaches in health and special education, uses testimonial evidence from "experts" to support its claims. At their Web site, a section titled "What do the experts say about the Irlen Method" (at www.irlen.com/testimonial_experts.htm),

Alan Bowd is Regional Director of the Centre of Excellence for Children and Adolescents at Lakehead University and a professor in the Faculty of Education. His research interests include educational psychology and special education. Address: Centre of Excellence for Children and Adolescents with Special Needs, Lakehead University, Thunder Bay, ON, Canada P7B 5E1.

Julia O'Sullivan is National Director of the Centre of Excellence for Children and Adolescents with Special Needs and Dean of Education at Lakehead University. Her research interests include cognitive psychology and early reading.

glowing accounts are posted, citing the value of Irlen lenses. The titles attached to these experts are meant to impress the public, but not all reflect expertise in the study of reading difficulties or visual perception. Special education administrators, school trustees, and psychologists make up the majority of those listed. Some also just happen to be Irlen screeners with a financial interest in promoting the Institute's products. However, nowhere in the text or quoted words of endorsement is this mentioned.

The Irlen Institute seeks publicity primarily through press releases and television appearances that involve carefully crafted testimonial evidence. The cover of Irlen's book proclaims that "because of this remarkable breakthrough [helping people suffering from SSS], Helen Irlen has been on two segments of *60 Minutes*, the subject of two half-hour segments on *60 Minutes Australia*, and the focus of a BBC special." Since then she has had many more public appearances, and the Institute has issued numerous press releases. Screeners have been advised to target school systems in particular, in order to take the benefits of Irlen filters to as many students as possible.



Research Evidence

Much of the early research on the effects of Irlen filters is of dubious value. One group of scientists described it this way: "Many of these studies have been difficult to interpret due to design problems, such as selection bias, sample size, heterogeneity of subjects, subjectivity of results, financial interests of investigators, and a failure to consider such factors as placebo effect, controls, and opthalmic status of subjects" (Menacker et al. 1993). Given the absence of a scientific rationale, skepticism within the scientific community was quite predictable. The skepticism was also promoted by Irlen's claim for the existence of Scotopic Sensitivity Syndrome since *scotopic* refers to the activity of the rods, receptors active in low levels of light, while her "syndrome" was identified in part as an intolerance for *high* luminosity.

Regarding autism, the Irlen Institute claims, "When the brain sees the world incorrectly and relays that information to the other senses individuals have difficulty interacting with the world around them." This simplistic statement is from a Web page suggesting that many individuals with autism have "sensory sensitivity/inhibition problems" that can be treated effectively using the Irlen method. For a fee of $28, parents can receive an evaluation questionnaire and a report will be returned to them. If treatment is indicated, the Irlen Institute advises that only one or two sessions are needed for lenses to be fitted (with no mention of cost, at this stage). It further recommends that the individual should be re-evaluated every six to twelve months. Again, no reference is made to cost. The only evidence presented for these claims is the testimony of Donna Williams, "the first autistic individual to wear Irlen Colored Filters."

Recent Scientific Research

It is ironic that the claims for a relationship between colored filters and reading improvement made by Irlen, and the methods used by her and her followers to market Irlen products, led most scientists to maintain a healthy degree of skepticism about a possible link. Irlen's use of testimonials, the poorly controlled studies done in the first half of the last decade, together with

the hypothetical SSS model, probably all contributed to the neglect of research concerning visual processes involved in reading, especially in mainstream special education.

At the time we began research for this article we had looked over *Reading By the Colors* and many of the brochures and checklists produced by the Irlen Institute, as well as a videotape featuring a testimonial by Donna Williams, an autistic adult, to an audience in a statement that reminded us of a religious revivalist meeting. As far as a relationship between colored filters and improved reading was concerned, we thought the research inconclusive and positive findings in some earlier studies best explained by a placebo effect.

In fact, more recently, researchers have provided some evidence that reading speed *can* be significantly improved for children with dyslexia in studies designed to eliminate placebo effects. However, the effects of color are most evident when text is small and closely spaced. With conventional print, color begins to make a difference only when the reader begins to tire (Wilkins 1996). These effects have been scientifically documented in a series of investigations by Arnold Wilkins at the University of Essex, England. However, while reading rate is an important *component* of reading, it is not appropriate to generalize to the complex behavior of "reading" from the number of words correctly identified in a timed period. Wilkins and his colleagues recommend that all children with reading difficulties be assessed for the benefit of overlays—a statement too far from the data in our view.

The London Institute of Optometry and the American Optometric Association have taken similar positions regarding the marginal relationship between vision and reading disability: "Although it is generally accepted that sight is not the main cause of dyslexia, certain visual complications do occur more often in dyslexic patients and these may contribute to reading and learning difficulties, especially for children."

The American Optometric Association's policy statement points out that "Vision therapy does not directly treat learning disabilities or dyslexia. Vision therapy is a treatment to improve visual efficiency and visual processing, thereby allowing the person to be more responsive to educational instruction. It does not preclude any other form of treatment and should be part of a multidisciplinary approach to learning disabilities" (American Optometric Association 2003).

Another statement from the American Optometric Association, "The Use of Tinted Lenses for the Treatment of Dyslexia and other Related Reading and Learning Disorders" (available at the association's Web site www.aoa.org) is even more forthright in its assessment: "Current research does not support the validity or presence of an actual visual perceptual dysfunction termed 'scotopic sensitivity syndrome.' Therefore the use of this term is meaningless." And: "It is the position of the American Optometric Association that: There is currently no scientific research to support the 'scotopic sensitivity hypothesis.'"

Despite the positions taken by professional organizations and the absence of credible evidence supporting the claims of Helen Irlen and her Institute, vulnerable parents and some teachers continue to place their hope (and their dollars) in colored overlays, lenses, and, more recently, contact lenses. Helen Irlen encourages parents to continue with her lenses, even when they are apparently ineffective: "Parents also should not be frightened when they see little improvement as their [autistic] child grows older. From what I have seen over the years, one cannot put an age limit on progress and change. You *should never give up hope—maturation and growth can occur* at any time, even when the individual is in their 20s, 30s or older" (Edelson 2003).

It might help, of course, to have your child regularly reevaluated by "professionals trained and certified in the Irlen method"—if you are prepared to continue to pay for something that doesn't work. And, as long as parents of children with special needs maintain them in a treatment program of questionable value, they are denied the opportunity to seek help from one that has scientific credibility.

Note

1. Dr. Whiting has pointed out that all the money made at the Sydney clinic went into college, now Faculty of Education, funds (personal communication, September 5, 2003).

References

American Optometric Association. 2003. *Vision, Learning and Dyslexia: A Joint Organizational Policy Statement of the American Academy of Optometry and the American Optometric Association.* Available at www.children-special-needs.org/parenting/dyslexia_dyslexic.html.

American Optometric Association. 2004. *The Use of Tinted Lenses for the Treatment of Dyslexia and other Related Reading and Learning Disorders.* Available at www.aoa.org/eweb/DynamicPage.aspx?site=AOAstage&WebCode=PediatricsTinted.

Edelson, S.M. 2003. An interview with Helen Irlen. Retrieved from www.autism.org/interview/irlen.html.

Irlen, H. 1983. Successful treatment of learning disabilities. Paper presented at the annual meeting at the American Psychological Association, Anaheim, California.

———. 1991. *Reading By the Colors: Overcoming Dyslexia and Other Disabilities through the Irlen Method.* Garden City Park, N.Y.: Avery.

———. 2000. The world of misperception—Irlen colored filters. *Latitudes,* 2(5). Retrieved from www.latitudes.org/prnfrnd/learn02_prn.html.

Irlen Institute. 2001. *Autism & the Irlen Method: Sensory Inhibition and Overload.* Available at www.irlen.com/autism_main.htm.

———. 1990. *Understanding Scotopic Sensitivity Syndrome.* Pamphlet published by Irlen Institute, Long Beach, California.

Menacker, S.J., M.E. Breton, M.L. Breton, J. Radcliffe, and G.A. Cole. 1993. Do tinted lenses improve the reading performance of dyslexic children? *Archives of Opthalmology,* 111, 213–218.

Robinson, G. 2003. *Australasian Association of Irlen Consultants, Inc.* Available at http://members.ozemail.com.au/~trevordt/Research-Summary.htm.

Scott, L., H. McWhinnie, L. Taylor, N. Stevenson, P. Irons, E. Lewis, M. Evans, B. Evans, and A. Wilkins. 2002. Coloured overlays in schools: orthoptic and optometric findings. *Ophthalmic and Physiological Optics,* 22, 156–165.

Wilkins, A. 1996. Helping reading with colour. *Dyslexia Review,* 7(3). Available at www.essex.ac.uk/psychology/overlays/reading%20disorders%20OC2.htm.

———. 2002. Coloured overlays and their effects on reading speed. *Opthalmic and Physiological Optics,* 22, 448–454.

Wilkins, A.J., E. Lewis, F. Smith, E. Rowland, and W. Tweedle. 2001. Coloured overlays and their benefit for reading. *Journal of Research in Reading,* 24(1), 41–64.

Fundamental Cosmological Understanding Eludes Us

JAMES N. GARDNER

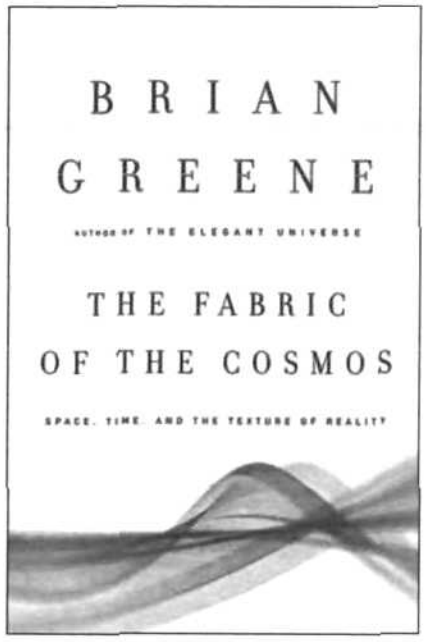
The Fabric of the Cosmos. By Brian Greene. Knopf, New York, 2004.
ISBN 0-375-41288-3. 576 pp. Hardcover, $28.95.

Brian Greene's new book, *The Fabric of the Cosmos*, reveals him to be a scientific romantic in the tradition of Albert Einstein and Stephen Hawking. "God does not play dice with the universe," Einstein famously quipped, disdaining the vision of irreducible uncertainty enshrined in the equations of quantum mechanics. When we search for a final theory, Hawking proclaimed in the stirring conclusion of *A Brief History of Time*, we seek to glimpse nothing less than the mind of God.

Greene writes in a similarly optimistic spirit, hoping to convince us that his field of physics (M-theory, previously known as superstring theory) has the potential to reveal the ultimate secrets of nature and to unify our best theory of the very large (relativity) with our most successful theory of the very small (quantum mechanics).

But is his argument convincing? This skeptic is forced to admit harboring serious doubts. While the conventional beef about M-theory among non-string theorists is that it is not falsifiable (and thus not genuine science), a more profound critique—curiously omitted from Greene's discussion—is that it does not appear to be "brittle" in the sense of yielding a single unique solution that corresponds to the universe we inhabit.

James N. Gardner is the author of Biocosm *(www.biocosm.org) which was selected by Amazon.com's editors as one of the ten best science books of 2003.*



The closest Greene comes to acknowledging this problem is the following passage:

> Over the last century, scientists have realized that the universe has the familiar features of common experience only because the [subatomic] particles . . . have precisely the properties they do. Even fairly minor changes to the masses or electrical charges of some of the particles would, for example, make them unable to engage in the nuclear processes that power stars. And without stars, the universe would be a completely different place. Thus, the detailed features of the elementary particles are entwined with what many view as the deepest question in all of science: *Why do the elementary particles have just the right properties to allow nuclear processes to happen, stars to light up, planets to form around stars, and on at least one such planet, life to exist?*

In fact, the universe unveiled by the hellishly complex mathematics of superstring theory is not even remotely close to what string theorists anticipated. Instead of a unique solution that corresponds to the world we inhabit, the theory has revealed instead a terrifyingly vast landscape of theoretically possible universes, the overwhelming majority of which would be utterly alien and devoid of any possibility of birthing life and intelligence. The equations of superstring theory provide no insights about how our particular universe, with all of its stunningly life-friendly physical characteristics, just happened to pop out of the Big Bang, seemingly pre-engineered to speed down the pathway of cosmological evolution toward the emergence of those very results.

Just how big is this landscape of possible alternative models of particle physics that's allowed by M-theory? According to Stanford physicist and superstring pioneer Leonard Susskind, the mathematical landscape is horrifyingly gigantic, permitting 10^{500} different and distinct environments, none of which appear to be mathematically favored, let alone foreordained, by the theory. And in virtually none of those other mathematically permissible environments would matter and energy have possessed the qualities that are necessary for stars, galaxies, and carbon-based living creatures to have emerged from the primordial chaos.

This is, as Susskind says, an intellectual cataclysm of the first magnitude, because it seems to deprive our most promising new theory of fundamental physics—M-theory—of the power to uniquely predict the emergence of anything remotely resembling our universe. As Susskind puts it, the picture of the universe that is emerging from the deep, mathematical recesses of M-theory is not an "elegant universe" at all. It's a Rube Goldberg device, cobbled together by some unknown process in a supremely improbable manner that just happens to render the whole ensemble miraculously fit for life. In the words of Steve Giddings, a theoretical physicist at the University of California, "No longer can we follow the dream of discovering the unique equations that predict everything we see, and writing them on a single page. Predicting the constants of nature becomes a messy environmental problem. It has the complications of biology."

Confronted with this mystery, advocates of M-theory-as-final-theory take two principal approaches. The first (apparently favored by Greene) is to continue searching patiently for a unique final theory—something that you could write on your tee-shirt like $E=mc^2$—which might yet, against the odds, emerge from M-theory or one of its competitors (like loop quantum gravity) aspiring to the status of a so-called "theory of everything." This is the fond hope of virtually every professional theoretical physicist, including those who have been driven to desperation by the horrendously messy and complex landscape of theoretically possible, M-theory-allowed universes that distresses Susskind and other superstring theorists. Perhaps the laws and constants of nature—an ensemble the late New York Academy of Sciences president and physicist Heinz Pagels dubbed the cosmic code—will, in the end, turn out to be uniquely specified by mathematics and thus subject to no conceivable variation. Perhaps the ultimate equations will someday slide out of the mind of a new colossus of physics as slickly and beautifully as $E=mc^2$ emerged from Einstein's brain. Perhaps. But that prospect appears increasingly unlikely.

A second approach, born of desperation on the part of Susskind and others, is to overlay a refinement of Big Bang inflation theory called eternal chaotic inflation with an explanatory approach that has been traditionally reviled by most scientists, known as the weak anthropic principle. The weak anthropic principle merely states in tautological fashion that since human observers inhabit this particular universe, it must perforce be life-friendly or it would not contain any observers resembling ourselves. Eternal chaotic inflation, invented by Russian-born physicist Andrei Linde, asserts that instead of just one Big Bang, there are, always have been, and always will be, zillions of Big Bangs going off in inaccessible regions all the time. These Big Bangs create zillions of new universes constantly, and the whole ensemble constitutes a multiverse.

Now here's what happens when these two ideas—eternal chaotic inflation and the weak anthropic principle—are joined together. In each Big Bang, the laws, constants, and the physical dimensionality of nature come out differently. In some, dark energy is stronger. In others, dark energy is weaker. In some, gravity is stronger. In others, gravity is weaker. This happens, according to M-theory-based cosmology, because the ten-dimensional physical shapes in which superstrings vibrate—known as Calabi-Yau shapes—evolve randomly and chaotically at the moment of each new Big Bang. The laws and constants of nature are constantly reshuffled by this process, like a cosmic deck of cards.

And here's the crucial part. Once in a blue moon, this random process of eternal chaotic inflation will yield a winning hand, as judged from the perspective of whether a particular new universe is life-friendly. That outcome will be pure chance—one lucky roll of the dice in an unimaginably vast cosmic crap shoot with 10^{500} unfavorable outcomes for every winning turn.

Our universe was a big winner, of course, in the cosmic lottery. Our cosmos was dealt a royal flush. Here is how the eminent Nobel laureate Steve Weinberg explained this scenario in a *New York Review of Books* essay a couple of years ago: "The expanding cloud of billions of galaxies that we call the Big Bang may be just one fragment of a much larger universe in which Big Bangs go off all the time, each one with different values for the fundamental constants." It is no more a mystery that our particular branch of the multiverse exhibits life-friendly characteristics, according to Weinberg, than that life evolved on the hospitable Earth "rather than some horrid place, like Mercury or Pluto."

If you find this scenario unsatisfactory—the weak anthropic principle superimposed on Andrei Linde's theory of eternal chaotic inflation—I can assure you that you are not alone. To most scientists, offering the tautological explanation that since human observers inhabit this particular universe, it must necessarily be life-friendly or else it would not contain any observers resembling ourselves is anathema. It just sounds like giving up.

One thing it certain: there is a profound mystery here, captured eloquently by the great Princeton physicist Freeman Dyson: "Mind and intelligence are woven into the fabric of our universe in a way that altogether surpasses our understanding." True enough, but the fundamental credo of science is that deep mysteries like these will someday, if only in the distant future, succumb to rational explanation.

M-theory, contrary to the faith expressed by Brian Greene and other superstring enthusiasts, may not turn out to be the final explanation of what Greene aptly calls "the deepest question in all of science"—why the universe is life-friendly. But M-theory's inherent shortcomings—its messiness and the fact that it seems to exhibit all the complications of biology—may offer valuable clues about the existence of some fundamental cosmological process or principle that lies just beyond the reach of current scientific theory. □

Well-designed Book Skewers ID Targets

MATT YOUNG

Unintelligent Design. By Mark Perakh. Prometheus Books, Buffalo, New York, 2004. ISBN 1-59102-084-0. 459 pp. Hardcover, $32.

The neocreationist William Dembski likes to talk of an archer who shoots at a target on a wall. If the archer can reliably hit the target, Dembski infers design in the outcome, rather than chance. *Unintelligent Design* by Mark Perakh is a well-designed book; Perakh has taken aim at a dozen or more targets, not the least of which is Dembski, and skewered them all.

Perakh is a physicist who began his career in the Soviet Union, passed through Israel and IBM, and is now Professor Emeritus at Cal State–Fullerton. He is well qualified in mathematics and physics, as well as common sense, and sticks mostly to those disciplines. He divides his targets into two groups, which I will call *primitive creationists* and *intelligent-design neocreationists.* Primitive creationists adjust the scientific record to force it into agreement with their literal interpretation of the Bible. Whether they are young-Earth or old-Earth creationists is irrelevant.

Neocreationists, by contrast, accept most of the evidence of modern science (such as the fossil record) but deny some of its conclusions. They are by far the more dangerous, because they write authoritatively and hide their religious motivations and their Bibles under a cloak of objectivity. In particular, they have succeeded in convincing much of the public that there is a viable alternative to the theory of evolution and that it should be taught in the public schools. They are well funded and politically astute.

The funding source, if not the motivating force, behind neocreationism is the Center for Science and Culture (CSC) of the Discovery Institute (formerly the Center for the Renewal of Science and Culture). As part of the CSC's Wedge strategy to substitute "theistic" science for real science in the public schools and elsewhere, its fellows have published twenty-three full-length books and run many conferences, seminars, and teacher-training conferences. Scientists may finally be fighting back. *Creationism's Trojan Horse* by Barbara Forrest and Paul Gross and *God, the Devil, and Darwin* by Niall Shanks appeared about the same time as Perakh's book, and my own anthology, *Why Intelligent Design Fails: A Scientific Critique of the New Creationism,* coedited with Taner Edis, appeared six months later. (Full disclosure: Perakh contributed one chapter to that book and coauthored another with me. Fuller disclosure: We disagree on a few things, including how to define the information contained in a meaningful message and Sir Karl Popper's theory of falsificationism.)

The stars of the CSC are Dembski, a mathematician; Wedge founder Phillip Johnson, a law professor; and Michael Behe, a biochemist. Johnson and Dembski together have written almost half of the Wedge's books, and Behe is notable for his *Darwin's Black Box.* (Behe is the only one of the three with a record of scientific publication.) The first part of Perakh's book is devoted to a critical analysis of their writings.

Dembski has developed what he calls an "explanatory filter" for distinguishing design from law and chance. The filter is a simple flow chart that assesses whether an "event" is the result of law or chance according to its probability. The event is attributed to law, for example, if its probability is high. But Perakh thinks that Dembski has it all backward: we do not infer a law because we think the probability is high. To the contrary, we think the probability is high because we already know the law; how else can we estimate the probability? Indeed, our estimate of a probability will change as we acquire more background information. Dembski's explanatory filter purports to filter chance and law, leaving design where appropriate. But it cannot work, says Perakh, because the appropriate high, middle, and low probabilities are not defined rigorously. In any case, low probability is not the same as impossible. For Perakh, all of Dembski's writings betray Dembski's intention to prove the preconceived notion that biological systems must have been designed by an intelligence.

Perakh can usually be counted on to come up with an interesting twist. For example, he examines Dembski's archer analogy and notes that a poor archer may well hit a large target with high probability. We cannot infer design just because the archer hits the target; we have to know something about the experimental setup. The archer hitting the target is a combination of physical law and chance, inasmuch as law takes over as soon as the archer releases the arrow; Dembski's bifurcation into law and chance is an oversimplification.

Dembski defines a quantity he calls *complex specified information,* which Perakh interprets to mean "a meaningful message." In the context of biology, a meaningful message might be the information encoded in the gene for a specific protein. Dembski promulgates a "law of conservation of information," as if it were a far-reaching principle of information theory. It is in reality no more than the statement that natural causes cannot write a meaningful message that contains more than 500 bits of information; it is

Matt Young is a former physicist at the National Institute of Standards and Technology and now teaches at the Colorado School of Mines. He is coeditor, with Taner Edis, of Why Intelligent Design Fails: A Scientific Critique of the New Creationism. *E-mail: mmyoung@mines.edu.*

not a conservation law. Perakh notes that 500 bits is equivalent to about a page of text. Thus, Dembski is saying that, even given a few billion years, natural mechanisms alone could not have evolved a genome with more information than a single printed page.

Dembski's definition of *information* is idiosyncratic, and Perakh confuses Dembski's use of the term with *information* in the communication-theory sense, where meaning is irrelevant. Dembski would agree, for example, that meaningless sequences of DNA can increase without limit; presumably, only useful genes are restricted to 500 bits, and exact copies do not count as additional information. Perakh argues that nothing prevents information in the conventional sense from increasing without limit, but that is not what Dembski claims. Thus, Perakh is here arguing at cross-purposes with Dembski.

Perakh next turns his attention to Michael Behe, author of *Darwin's Black Box*. Perakh notes that both Behe and Dembski associate design with complexity. Again, says Perakh, they have it backward. We recognize a design because it is simple, not because it is complex. If Perakh were lost near Rome, he would not say, "All roads lead to Rome," and start walking arbitrarily. He would get a map and find the shortest route. The intelligently designed route is the shortest and simplest, not the longest, most complex route with the most twists and turns.

Similarly, Perakh asks, if you found a sphere in a pile of jagged pebbles, which would you assume was designed? You'd choose the sphere, because its shape is simple, whereas the pebbles have complex shapes. You might, incidentally, get a false positive if you found a pearl, so neither complexity nor simplicity alone is enough to force a judgement of design. In Dembski's terms, you need to employ *side information* (you recognize it as a pearl), but in this case, the side information, not the explanatory filter, leads to the conclusion that the pearl has a natural origin.

Behe has coined the term *irreducible complexity* to describe a system that contains many interlocking parts, all of which are necessary for its functioning. If all the parts are necessary, then there is by definition no redundancy, so failure of any one part will mean failure of the entire system. Not only is that bad design, says Perakh, it is contrary to the evidence, which shows that biological systems have many redundancies that prevent complete failure in case any one component fails. He could have added that Behe has failed to provide any evidence that a system cannot evolve to be irreducibly complex, presuming that the interlocking parts co-evolved and only gradually did the system become critically dependent on each part.

Perakh characterizes Johnson as a "militant dilettante" who has the chutzpah to tell scientists what they are or are not doing. Johnson's training as a lawyer, implies Perakh, makes him less than qualified to critique science: scientists are trained to evaluate evidence and consider both arguments for and against their hypotheses, that is, to search for the best explanations they can find. Lawyers, by contrast, are often adversarial and want to prove their side of a case, rather than learn the truth—to prove *that*, not find out *whether*. It is undoubtedly true that lawyers are trained differently from scientists, but, contrary to Perakh, Johnson's problem is arguably that his irrational adherence to a religious belief forces him to deny known facts rather than accommodate his religion to those facts and to wrongly accuse the majority of the world's scientists of behaving precisely as he does.

Specifically, Johnson claims that scientists believe only what they want to believe; they support Darwinism because it is dogma. These are odd charges from someone whose religious beliefs have led him to undertake a frontal assault on modern science, and Perakh again turns the argument around: he asks for a single experiment or careful observation that confirms any religious belief. Perakh, however, is not antireligious, and he notes that scientists may be religious or not, but even religious scientists accept evolution. Perakh compares Johnson's attitude to that of a physicist who learns the laws of thermodynamics but refuses to study statistical mechanics (which underlies thermodynamics) in favor of the hypothesis that the laws are divinely granted.

Johnson arrogates to himself the responsibility to instruct scientists and, for example, tell them the difference between natural and unnatural causes. Perakh, unfortunately, loses his patience several times and asks condescending questions like, "Really, Mr. Johnson? Are Darwinists such fools that they need a lawyer to teach them the meaning of common terms?"

You could quit reading the book at that point or skip to the third part of the book, but either would be a mistake. In the second part, Perakh turns to reviews of books by a variety of primitive creationists. Life is short, and I am a slow reader, so I have not read most of these books. I am, however, familiar with the writings of Gerald Schroeder and Hugh Ross, and I found Perakh's discussion of their works compelling. Perakh's chapter on the Bible code, which I thought he should have put into this section, is also right on the mark. His fluency in Hebrew enhances this chapter as well as one or two others.

The third part of the book discusses the practice of science as seen by a scientist. I doubt that science is as cut and dried as Perakh implies, and I did not see the need for some of his categories, but he takes the nonscientist on a nice tour from experiments and data, through laws, and on to models and theories. He defines what he calls a *bridging hypothesis*, or the hypothesis that a given data set represents an objective law; the data plus the bridging hypothesis allow us to infer the law. His claim that the bridging hypothesis happens to be true most of the time seems like an overstatement, however. Nonspecialists may be interested in his comment that data by no means imply a law (such as the inverse-square law) but rather that we use simplicity or elegance to guess at a law and then compare our guess with experiment or observation.

Likewise, Perakh explains that a model is an analogy that extracts salient features and omits unnecessary features. Behe's irreducible complexity is based on a bad model, however, because Behe's archetype, the mousetrap, cannot replicate and (according to Behe) has no redundant parts, whereas biological

systems replicate and display redundancy. Perakh might have added that phenotypes generally change incrementally from one generation to the next, whereas the next-generation mousetrap may look nothing like its spiritual ancestor. This entire chapter, incidentally, would have been much stronger, or at least more relevant to the chapters in the first part of the book, had more of the examples been drawn from biology.

Perakh briefly discusses science and the supernatural. He argues that there is no need to define science so that it excludes the supernatural. So far, observations or events that have been attributed to supernatural causes have not been supported by reliable evidence. Still, if a deity has left her footprints, science ought to be allowed to look for them. It will be hard, however, to avoid the argument that any inference to the supernatural uses a God-of-the-gaps argument. In this regard, Perakh could have spent more time discussing Johnson's claim that naturalism necessarily excludes a deity.

The chapter on probability makes some good observations, especially that probabilities are hard to estimate off the top of the head and that sometimes rigorously correct results are counterintuitive (depending, of course, on how good your intuition is). Perakh discusses for what seems like the *n*th time that small probability does not imply impossibility. The book is an anthology, most or all of which has been previously published on the Web, and it could have been much better edited and less repetitive. Indeed, Perakh apologizes in a footnote for the redundancy.

At any rate, I found one argument unconvincing: It is true that if I roll a die one hundred times and get some random-looking sequence, that sequence is no more probable than a sequence of all fours. All sequences are equally probable; it is only psychological, says Perakh, that we notice a sequence of one hundred fours in a row. I do not agree that it is only psychological. Only a few dozen or a few score sequences would attract our attention; the odds in favor of rolling any one of these sequences are very small. Indeed, if Perakh wanted to test whether his dice were fair, he would roll a die perhaps one hundred times and then check the sequence to see whether it was approximately random. If he rolled all or even mostly fours, he would suspect a loaded die. The flaw in the neocreationists' logic is not simply to conflate impossibility with improbability but, as Perakh points out, to do the calculations wrong.

Perakh's afterword is a gem. Though presumably an unbeliever, he shows his respect for religious beliefs. He clearly distinguishes the question of whether there is a deity—a question he thinks will never be answered definitively—from the truth of particular religious beliefs. I think he may be a bit harsh calling both atheism and theism irrational—I would say they could be *non*-rational—but his main concern in this book is to refute the faulty arguments of creationists, not religious thinkers in general. I have only minor reservations in claiming that he has done exactly what he has set out to do.

Acknowledgement

Thanks to Niall Shanks, Taner Edis, Glenn Branch, and, especially, Jason Rosenhouse, for their critical readings of a draft of this review.

'Great Discoveries' Series Off to a Promising Start

GREG MARTINEZ

Everything and More: A Compact History of Infinity. By David Foster Wallace. Atlas Books, W. W. Norton & Company, New York, 2003. 319 pp. Hardcover, $23.95.

The Doctors' Plague: Germs, Childbed Fever, and the Strange Story of Ignac Semmelweis. By Sherwin B. Nuland. Atlas Books, W. W. Norton & Company, New York, 2003. 191 pp. Hardcover, $21.95.

In October 2003 W. W. Norton embarked on a long-range publishing venture of science books that would follow a formula that was employed to great success by the Penguin Publishing Group in its "Penguin Lives" series of biographies. The idea was to pair a prominent prose writer with a prominent historical figure to produce brief but cogent biographies of the subject. Norton has begun their version of this project under its Atlas Books imprint calling it "Great Discoveries," and has taken the idea a step further. The pairings of authors and subjects promise a frisson of interest because of the sometimes unlikely pairings.

One of these unlikely couples is the first book of the series, David Foster Wallace's *Everything and More: A Compact History of Infinity.* Wallace is a novelist, short story writer, and essayist, and he would seem an unlikely choice to write a biography of Georg Cantor and his landmark contributions to the field of mathematics and the study of infinity. But Foster takes pains to provide an overview of his extensive research into the subject and adequately proves his bona fides as one to write about such a difficult subject. That he is such an ebullient prose stylist is of great help in reaching out to the intended general audience.

What could be a forbidding subject is addressed with sharp wit and a welcome clarity of expression and is leavened with biographical analysis of the central figure in the story, Georg Cantor, and many other prominent mathematicians. Wallace resists the trite

Greg Martinez lives and writes in Gainesville, Florida.

narrative arc of Cantor's descent into mental illness while working on the problem of the infinite to shape his book. While the lives of the prominent figures in this era and Cantor's predecessors are sketched out, the thrust of the book is the discussion of the many threads of thought and research that combined to form Cantor's role in the development of set theory and analytical philosophy. While the book is sometimes difficult and intimidating, Wallace is an especially clear explainer, and the power of his prose pulls the reader along through some very difficult passages.

In another unexpected turnabout, Sherwin B. Nuland, a medical doctor and clinical professor of surgery at Yale Medical School (and author of many books including the National Book Award winner *How We Die*), employs many novelistic techniques in his volume *The Doctors' Plague: Germs, Childbed Fever, and the Strange Story of Ignac Semmelweis.* The book's opening chapter is a dramatic piece of fiction imagining the progress of an unwed young woman in mid-nineteenth century Vienna as she enters the Allgemeine Krankenhaus, the major hospital at the time, and is maltreated and eventually infected with puerperal fever by the medical students charged with the delivery of her baby. It is staggering to think that there was a time when it was considered proper medical procedure to perform an ungloved autopsy of a diseased corpse and then to perform pelvic examinations of parturient women without pausing to wash one's hands, but such was the case in this era of early medicine. Nuland depicts this in queasy detail.

Nuland then moves on to a clear and interesting clinical explanation of puerperal fever and the carnage it created across the world during this era. A scourge of hospitals worldwide, this childbed fever was much examined and many theories were advanced, most of which would be laughable if the results of such misguided thinking were not so tragic. It wasn't until a Hungarian obstetrician took up practice in the Allgemeine Krankenhaus in the 1840s and began to observe that if practitioners would actually wash the pus, blood, and tissue from the dead mothers that they spent the morning dissecting before delivering the babies of the mothers in the upstairs wards that afternoon and evening, the rate of infection plummeted and survival rates climbed. The story of this doctor gives a dramatic and suspenseful narrative shape to the rest of this volume.

It wasn't until a Hungarian obstetrician in the 1840s began to observe that if practitioners would actually wash the pus, blood, and tissue from the dead mothers that they spent the morning dissecting before delivering the babies of the mothers in the upstairs wards that afternoon and evening, the rate of infection plummeted and survival rates climbed.

While Ignac Semmelweis got the source of the problem correct, his attempts at scientific testing and proving his theory were pathetically wrongheaded and poorly designed and executed. Such poor science was especially unfortunate when one realizes that Semmelweis's insistence on cleanliness and hygiene totally undermined the conventional wisdom on the causes of disease transmission and was met with stubborn resistance by the medical establishment of the time.

This lack of data only helped to reinforce the resistance to Semmelweis, which was exacerbated by his abrasive personality and dogmatism about the correctness of his theory with nothing to prove it except the steadily decreasing numbers of infection and deaths from his ward in the hospital. Had Semmelweis even tried to smear a bit of the pus onto a slide and viewed it under the microscope in the hospital he would have seen the bacteria that were the culprit, but he insisted that the results in his ward spoke enough to the problem and its solution.

Semmelweis ostracized himself from the medical community of his day because of his ever-increasing bellicosity, eventually firing off letters to the leaders of medical schools and hospitals in Europe calling them murderers because of their resistance to his ideas. It is tragic that the resistance to Semmelweis's theory was mostly of his own making. The full discovery of germ theory would have to wait until better scientists with more temperate personalities like Pasteur, Lister, and Koch would do the necessary work that would create a revolution in medical treatment.

Norton plans to follow up these two excellent volumes with more tantalizing pairings of author and subject. Novelists like Madison Smart Bell and David Leavitt will address Lavoisier and chemistry and Turing and the computer, respectively. Classicist Daniel Mendelsohn will write about Archimedes and the science of the ancient Greeks. Additional titles will include science writers like Michio Kaku on Einstein and relativity and Barbara Goldsmith on the Curies and radioactivity. These two volumes are the bright start to what looks to be a noteworthy series of publications.

A Response to Myths about Reinforcement

PETER LAMAL

The Power of Reinforcement. By Stephen Ray Flora. State University of New York Press, Albany, New York, 2004. ISBN 0-7914-5916-0. 269 pp. Paperback, $19.95.

For decades, behavior analysts have complained about, and responded to, mischaracterizations of behavior analysis. These mischaracterizations have almost universally been egregious and have typically centered on certain myths, such as behavior analysis embracing the notion that humans are blank slates upon which experience writes, one's genetic makeup contributing nothing to one's actions. Such errors have been perpetuated by textbook writers and other academics.

Stephen Flora's book, aimed at the general public, is a response to the myths, mischaracterizations, and unwarranted criticisms of the purposeful use of reinforcement by and for humans. Flora maintains, correctly in my view, that such myths have prevented potentially useful programs.

In the book's introduction, Flora defines technical terms that he uses throughout the book such as *positive reinforcement* and *negative reinforcement.* He also describes how his father used principles of reinforcement to help teach him to read after his first-grade teacher said that he would never learn to read or write in the public schools. In Part I, Flora addresses six myths about reinforcement. He shows that each involves a misunderstanding of behavior analysis and that empirical claims said to refute the efficacy of reinforcement are unsupported by the evidence. For example, according to the Myth of Rat Psychology, reinforcement principles have no relevance for humans, because many of those principles stem from research conducted with nonhumans. The Myth of M&Ms for the Retarded holds that while reinforcements such as candy or tokens that are exchangeable for other reinforcers can work with developmentally disabled persons, such reinforcers are ineffective in changing the behavior of the nondisabled. Carrot-And-Stick Control, Bribery is the myth that reinforcers are bribes, and that to intentionally use reinforcement with humans is to treat them as something other than human.

Flora devotes Part II to descriptions of the application of reinforcement theory to social problems as well as individuals' afflictions, presenting as evidence supporting his thesis that reinforcement practices are useful in solving these problems. He examines such issues as education, drug abuse and recovery, crime and corrections, depression, chronic pain, undue dependency on others, and the inculcation of self-discipline, often presenting surprising conclusions. Research suggests, for example, "that *perceived* seriousness and severity of illness is *not* a function of biological, physiological health. *One's perceived seriousness and severity of illness is a function of, caused by, one's history of reinforcement for illness* (emphasis in original)."

There are a few technical and editorial problems with this book, as well as a few conceptual issues. For example, I disagree with the assertion that a defining characteristic of creativity is that it is a *useful* behavior. I also question the assertion that "people cry and learn to cry because it produces reinforcement from the social environment." Is that the only cause of crying? Could there not be reflexive crying, not at all related to the social environment?

But these issues should not deter readers. Flora has performed a valuable service for behavior analysis, and, more important, for society. I strongly recommend this book, particularly for those outside the discipline of behavior analysis. □

Peter Lamal is Emeritus Professor of Psychology at the University of North Carolina at Charlotte and a Fellow of the Division of Behavior Analysis of the American Psychological Association. E-mail: plamal@carolina.rr.com.

Listing does not preclude future review.

The Mystery Chronicles: More Real-Life X-Files. Joe Nickell. Foreword by James Randi. University Press of Kentucky, Lexington, 2004. 384 pp. $29.95, hardcover. The human blowtorch. The Amityville Horror. Crop circles, spontaneous human combustion. Swamp monsters. The Turin Shroud. Psychic pets. John Edward, Benny Hinn. Joseph Smith. Charles Fort. The indefatigable investigator Joe Nickell (CSICOP's Senior Research Fellow and SI's Investigative Files columnist) here examines forty-one new cases and claims, bringing his unique expertise to solving them, most often finding natural, scientific explanations. Throughout he demonstrates the power of his neither-too-credulous nor too-dismissive attitude, actually investigating mysteries rather than seeking answers to fit preconceived notions.

The Making of Bigfoot: The Inside Story. Greg Long. Foreword by Kal K. Korff. Prometheus Books, 2004, 476 pp. $25, hardcover. A thorough exposure of the hoax of the most famous of all films of "Bigfoot," the 1967 Roger Patterson/Bob Gimlin film. Long interviewed more than forty witnesses in Yakima, Washington, who knew Patterson personally. He found out where the gorilla suit used to make the film was made, the person who wore the suit, and the actual plan for making money out of the hoax. Kal Korff's article in this issue summarizes the major aspects of Long's revelations.

The Robot Rebellion: Finding Meaning in the Age of Darwin. Keith E. Stanovich. University of Chicago Press, 2004. 358 pp. $27.50, hardcover. Folk psychology remains sealed off from evolutionary insights and neurophysiological facts, says author Stanovich (who holds the Canada Research Chair in Applied Cognitive Science, University of Toronto). He wrote this book to explain the conceptual reorientations that the biological and human sciences are forcing on us. *We* are the robots of his title: cognitive research and evolutionary biology have shown that we exist to replicate our genetic material. But how, as a result, can we escape this evolutionary determinism? He holds that this "robot's rebellion" becomes possible when humans begin to use knowledge of their own brain functioning to serve their own ends. We have two types of cognitive processing, one short-term, reflexive thought subject to impulse and abandon, the other higher-order thinking that is mostly undeveloped and is responsible for art, literature, problem-solving, and so on. He offers ways to develop that part of our cognitive selves and complete the "robot's rebellion."

Are You Conscious and Can You Prove It? Short Science Essays. Sid Deutsch. iUniverse, New York, 2003. 201 pp. $27.95, hardcover. Magnet therapy, free will vs. determinism, the origin of life, the "fantastic" pacemaker system, UFOs, multiple universes, the claim that photons can communicate at faster-than-light velocities, what makes suicide bombers tick. These are among the topics addressed in this collection of twenty-two short science essays by a biomedical engineer, CSICOP scientific consultant, and former associate editor of *IEEE Transactions on Biomedical Engineering.* Deutsch hopes that "one or more of the ideas" expressed in the book will "resonate, here and there, with the intelligent layperson."

The Foreseeable Future: A Rational Approach to Prediction. Raymond Friedman. Inkwell Productions, 3370 N. Hayden Rd., #123-276, Scottsdale, AZ 85251, 2003. 173 pp. $14.95, softcover. Following a successful career in industrial research, the author here seeks to apply rational thought to future possibilities. He steers away from topics that involve human behavior, strongly influenced by emotional and other nonrational attributes that can't be predicted in rational or scientific terms. Sections are devoted to "some predictions of dubious value" (astrology, oracles, prophets, etc.); successful predictions and discoveries based on the scientific method (aviation, age of Earth, germs, weather, space travel, oil drilling); successful predictions by extrapolation of trends and use of statistics (elections, insurance industry, casinos); attempts at economic forecasting; and a look into the future (population, global warming, fusion power, robots, nanotechnology, etc.).

—*Kendrick Frazier*

SCIENCE BEST SELLERS

Top Ten Best Sellers

1 ***The Golden Ratio: The Story of PHI, the World's Most Astonishing Number***
Mario Livio

2 ***Consciousness: An Introduction***
Susan J. Blackmore

3 ***Six Modern Plagues and How We Are Causing Them***
Mark Jerome Walters

4 ***Why We Love: The Nature and Chemistry of Romantic Love***
Helen Fisher

5 ***For Love of Insects***
Thomas Eisner

6 ***Foundations and Fundamental Concepts of Mathematics***
Howard Eves

7 ***e: The Story of a Number***
Eli Maor

8 ***A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love***
Richard Dawkins

9 ***Wider than the Sky: The Phenomenal Gift of Consciousness***
Gerald M. Edelman

10 ***The Quest for Consciousness: A Neurobiological Approach***
Christof Koch

By arrangement with *Scientific American* (www.sciam.com), May 2004.

Fictional Cops Slay Imaginary Giant Critter

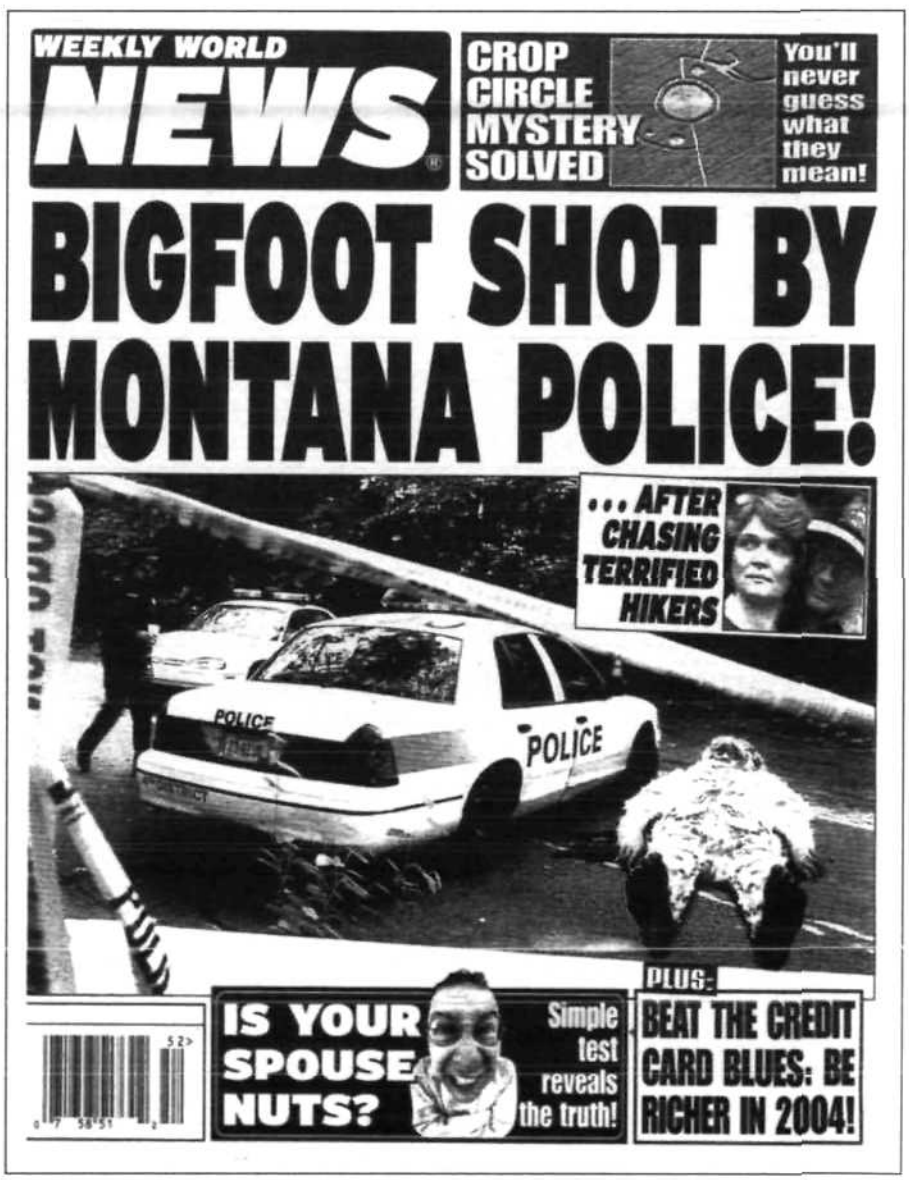
ED KEMMICK

A few weeks after *Billings Gazette* reporter Jim Hagengruber took a new job in Coeur d'Alene, Idaho, the biggest sasquatch story in years broke in Montana.

I couldn't reach Hagengruber to get his reaction, so I can only imagine the deep sense of failure he must have felt upon seeing the headline—"Bigfoot shot by Montana police!"—on the cover of the December 30, 2003, edition of the *Weekly World News.*

Hagengruber was *The Gazette*'s top reporter on the Bigfoot beat, though some of the editors thought he shouldn't have been wasting his time on sasquatch stories. Now he has been vindicated by no less prestigious a journalistic outlet than the *Weekly World News.*

True, there are some anomalies in the story, and some troubling questions have been raised about the black-and-white cover photo accompanying it, but a grocery store tabloid wouldn't just invent a story out of thin air, would it? Some of the other headlines in the Dec. 30 issue—"Pope OKs space alien priest" and "Man travels world on Monopoly money!"—sound a little suspicious, but let's stick to the sasquatch.



Ed Kemmick is a writer for the Billings Gazette, *where this article first appeared.*

A Frisky Bigfoot

The gist of the *WWN* story was that a couple from New Zealand was hiking in Beaverhead Rock State Park, between Dillon and Twin Bridges in southwestern Montana, when they were accosted by a leering Bigfoot who apparently had amorous designs on the female New Zealander.

I talked to Lt. Col. Randall Yaeger, deputy chief of the Montana Highway Patrol (MHP) in Helena, who said he was not "officially aware" that any officers under his command—all of whom drive black patrol cars—had had an encounter with a Bigfoot.

"If something like that were actually to happen," he said, "our guys would be so proud of it we couldn't keep it a secret."

"We used to have an employee down there with a real hairy back and a big beard... Come to think of it, we haven't heard from him in a while."

After running for twenty minutes, with the Bigfoot in hot pursuit, the couple, "bedraggled and drenched in sweat," reach a road, where two Montana Highway Patrol officers, luckily, were passing by. The troopers ordered the 7-foot-tall hominid to stop, but when it didn't, they blasted him with thirty rounds to the chest. The photo shows hairy Mr. BF on his back on the highway, apparently right where he went down.

Now for the difficulties. The photo shows white squad cars with the word "police" on the trunk and side, and on one car there is a license plate beginning with "23," the number for Musselshell County.

Capt. David Dill, head of the Billings region for the Highway Patrol, said MHP cars say "Highway Patrol" on the side, and all of them have Lewis and Clark Bicentennial license plates that begin with "MHP," followed by the officer's badge number.

"I can assure you," he said solemnly, "we didn't shoot a Bigfoot."

The Roundup Connection

I thought perhaps the *WWN* reporter had somehow confused Roundup cops with Highway Patrol officers, but Rosie Mercado, the dispatch supervisor in Roundup, blew that theory away.

For starters, she said, there are no "police" cars in Roundup, only Musselshell County sheriff's vehicles. And she doubted very much that any Musselshell County deputies were cruising near Beaverhead Rock State Park, far to the west.

"As far as I know, I haven't seen no sasquatch run over or shot or nothing like that," she said firmly.

I began to wonder why everyone sounded so certain of their facts, so . . . defensive. What were they trying to hide?

Doug Monger, administrator of the Parks Division of the Department of Fish, Wildlife and Parks, also tried to cast doubt on the story. He said it would be hard to imagine anyone being chased for twenty minutes through the seventy-one-acre park, and he described Beaverhead Rock as a "sagebrush mound" bearing none of the thick foliage shown in the *WWN* photo.

Despite his evident skepticism, Monger offered up an intriguing possibility: "We used to have an employee down there with a real hairy back and a big beard," he said. "Come to think of it, we haven't heard from him in a while."

This was Monger's official statement. He also said, in hushed tones, though he may have to deny it, "I'd love to tell you everything I know, but I've been threatened with death, and not just by scientists."

Did you hear that, Hagengruber? Your Pulitzer Prize is waiting for you, back in Montana. □

THE SCIENTIFIC REVIEW OF MENTAL HEALTH PRACTICE

The Scientific Review of Mental Health Practice is an interdisciplinary journal that examines the evidence (or lack thereof) for a host of untested and disproved therapies and assessment techniques being popularized by sensational stories in the lay media, radio talk shows, and in countless self-help books.

Subscribe today! Get a one-year subscription (2 issues) for $60 for individuals in the U.S. and Canada, $70 for individuals overseas, or $100 for institutions in the U.S. and abroad.

Here are three easy ways to subscribe to ***SRMHP***:

1. Call **(800) 818-7071** to place a credit card order
2. E-mail your order with your American Express, Visa, or MasterCard number to **SRMHPsubs@yahoo.com**
3. Send your check made out to Center for Inquiry to: **SRMHP, Center for Inquiry, P.O. Box 741, Amherst, NY 14226-0741**

Missing Time with Art Bell

ALEXANDER D. ALLINS

Now that Larry King took over the spotlight in the land of psychic phenomena, UFO, and UFO abductions, one feels a wave of warm nostalgia for Art Bell. To those who do not frequent the AM dial of the radio between the hours of 10 P.M. and 5 A.M., it may be worthwhile to mention that Mr. Bell, until recently when he was replaced by the radio-show host George Noory, was the host of the *Coast to Coast* AM radio show. The show's format centered on all sorts of madcap ideas so blatantly "borrowed" by Larry King of CNN.

Why would a man who proudly displays a "CSICOP Associate Member" certificate on the wall of his office listen to such drivel as *Coast to Coast*, one may ask? Well . . . the intellectual rationalization that appears on the pages of SKEPTICAL INQUIRER seems to be that a true skeptic is someone who keeps an open mind. In reality, the reason for listening to the callers that inundate the radio aether is simply this: They just make one feel so . . . so . . . normal. Yes, normal. Normal by comparison.

Fortunately, while George Noory hosts the show on weeknights, Art Bell still sits in the host's chair on the weekends. C'mon, fellow skeptics! One cannot *not* like Art. The dear man literally defines *poppy* in the Dutch *poppycock*. Consider the show that graced the Los Angeles airwaves on January 10, 2004.

Mr. Bell starts by impressing his audience as soon as the show hits the air. During that night's show, he said he would physically produce *bona fide* scientists that would confirm the phenomenon of "missing time." Oh yes, ladies and gentlemen, the very "missing time" that so frequently accompanies the phenomenon of alien abductions; the alien abductions where the UFOs swoop out of the sky attracted by some fluctuations in Earth's magnetic field; the fluctuations that are noticed around the areas of antenna towers, radio telescopes, power generation plants . . . etc., etc. Some of this lore would be implied while other portions of it would be proven on that night's show. And, more impressively, it would be shown that Art Bell himself was a witness to, and participated in, one most singular experience.

The event involved two scientist friends of Art, whom he identified as "Bonnie Kristel" (spelling of the last name is phonetic), a geologist who specializes in exploration of underground caves, and her friend and co-traveler "Jessica" (not mentioned by her last name during the show, but identified later in the program as a physicist). The women were driving from the San Francisco Bay area to Las Vegas, Nevada, where they planned to attend the annual Consumer Electronics Show (CES). Some time after leaving the Bay area, they apparently experienced a clear-cut episode of "missing time." In the course of the program, it also transpired that not only the intangible fabric of time was disrupted; the entire town of Mojave, California—a small desert community in the Golden State—had inexplicably disappeared off the face of the Earth as well.

Here is an excerpt from the show as best as it could be transcribed (square brackets indicate statements added):

Art Bell: *"Here's a homegrown weirdness for you. Bonnie Kristel and her business associate Jessica . . . were on their way from the Bay Area to CES Las Vegas.*

I was talking to Bonnie, who is a ham radio operator, on a 40M band . . . and so right in the middle of the conversations.

"Bonnie": *It was day before yesterday. In the afternoon. Midday. And we were traveling over the mountains of Tehachepy* [California] *toward Las Vegas. . . . And we got to the top of the mountain. And they have a big windmill farm plant there, where they have windmills generating electrical power there. . . .*

Art Bell: *Yes, it's quite incredible actually.*

"Bonnie": *. . . and we saw the windmills and when we got to the top we were talking to you on the ham radio. And you got off for a few moments.*

Art Bell: *I said I'm gonna get a bite to eat. And we signed off temporarily. And I said I'll be back in a few minutes. And . . . then I guess the next time I heard you was easily an hour, maybe more than an hour, later. . . . I was calling you. And then suddenly there you were . . . so, what happened?*

"Bonnie": *Well, it seemed like only a few minutes to me. But it ended up being forty-five minutes or an hour later. And the funny thing is that you can be driving and not realize that you passed an exit. But this particular instance, Jessica and I both realized this at exact same time. . . .*

Art Bell: *You realized that you'd lost an hour?*

"Bonnie": *Somehow we got transported to a place further away than we were actually headed to.*

Art Bell: *How much further?*

"Bonnie": *Well it was at least forty-five miles or fifty miles away. . . .*

Art Bell: *Plus you passed a place where you normally would have stopped for gas and all the rest of it. I mean you actually planned to stop for gas, right?*

Alexander D. Allins is a physician in Los Angeles.

"Bonnie": *Yes, we planned to stop for gas at a town called Mojave.*

Then the discussion turned to the description of the stop at Mojave. It appears that both women not only simultaneously "lost" close to an hour of their lives, but they have also lost the entire town of Mojave, California:

"Bonnie": *And we don't remember anything about that. And the funny thing is that we both remember nothing about that period of time.*

The conversation then turned to how the two women found themselves way past Mojave, California, next to a solar energy plant near the exit for Kramer Junction, California.

Art then asks for Bonnie's friend, Jessica, to come to the phone and proceeds to interview her on air. Jessica essentially confirms her friend's story:

Art Bell: *So, Jessica, so what do you think happened out there?*
"Jessica": *I have no idea. I'm a* physicist, *so I'm supposed to understand these things. And the strange thing is that Bonnie's and my memories ended at the same time. And our memories of the power plant started at the same time. . . . It's like someone cut these forty-five minutes out of my life. . . .*
Art Bell: *You are not a strong believer in the paranormal, are you?*
"Jessica": *No. I am not. I believe in physics of the world. That things should operate a certain way. They are not supposed to happen like this.*
Art Bell [with utmost sense of mystery]—*Ah ha, but they do. And they did.*
"Jessica": *It happened.*
Art Bell: *It happened the day before yesterday.*
"Jessica": *And it shook me up, as you remember. . . . It was definitely an earthshaking experience. This stuff is not supposed to happen.*
Art Bell: *But it does, doesn't it?*
"Jessica": *Yes it does. I can attest to that now. And now I'm getting goose bumps telling you.*
Art Bell: *He-he-he. Oh-ho-ho. Listen, I really appreciate the two of you coming on the air. . . .*

A short discussion of the Computer Electronics Show in Las Vegas, Nevada, follows. Art Bell winds down this segment of his show while still talking to "Jessie":

Art Bell: *Well, now look, I want to thank you, and I want to thank Bonnie for coming on the air. And it will probably spark a conversation. I have no idea what happened to that time. Where you might have been. . . . You've checked your body, haven't you? He-he-he . . .* [Could Art possibly be implying an alien abduction here? Alien experimentation on humans? Strange and unexplained body scars and subcutaneously placed alien artifacts?]
"Jessica": *Yes. That's the first thing I thought was, something, like, weird happened in the middle of the afternoon . . . along a highway. . . . It wasn't even the night time. . . .*
"Bonnie": *In the broad daylight . . . two individuals who pride themselves on being scientists. . . .*
"Jessica": *We are scientists. This stuff doesn't happen to us. We hear about this. But to experience this is . . . spooky. I'm sure some of your listeners have some experiences like this.*
Art Bell: *Well, congratulations and welcome to the club.*
"Jessica": *There are more things than heaven and earth, right?*
Art Bell [concludes the call by addressing the listening audience over the airways of *Coast-to-Coast*]: There *was an experience worth hearing about. . . . The question is: Where were they? Or when were they? Or whatever? So, maybe some of the rest of you had some experience with something like this. But I thought I'd toss it out for what it's worth. And it's certainly worth something.*

Later in the show, Art takes a call from a female truck driver:

Art Bell: *"Wild Card" line, you are on the air! Hello.*
Caller: *Hello. I was wondering if anyone has called in yet with an explanation about where Bonnie's fifty minutes went?*
Art Bell [with just a touch of condescension in his voice]: *And where, pray tell, did her fifty minutes go?*
Caller: *Well, Highway 58 between Barstow* [California] *and Tehachepy doesn't go into Mojave anymore. You gotta exit off highway to get into Mojave now. They completed the bypass* [a new bypass that circumvents the town of Mojave altogether]. . . .
Art Bell [interrupting with a tinge of incredulous disappointment]: *Oh, really!*
Caller: *The whole highway was under construction. And she* [Bonnie] [was] *right about when she was going by the windmills there on Tehachepy. . . .*
Art Bell: *Yeeeaaasss!*
CALLER: *Well, about forty-five minutes later would put her by the truck stop there by the Kramer Junction* [using the new bypass around Mojave].
Art Bell [strained chuckle]: *Ah-hah-huh-huh. . . .*

Art changes topic to a friend of his, also a truck driver, "whose name is Tim" who apparently also experienced several instances of "missing time." Without batting an eyelash, Art turns the conversation back to the topic of "missing time" and inquires of the caller if she has experienced any "missing time herself"—good going, Art! One must admit that Art's replacement on the show, George Noory, would never be able to backpedal so seamlessly and elegantly as Mr. Bell!

The caller is nonchalantly faded off the air, and Art concludes with this deepest of thoughts: "If people in the eighteen-wheelers, you know the big ones, are missing time, then what the hell is the truck doing in between?" Forget it that the woman truck driver just reduced the entire claim of "missing time" by Art's two "scientist" friends to a laughable blunder—obviously, and without realizing it, the women simply took a new bypass that took them around the town of Mojave.

But Art's listeners did not let him forget. Approximately ten minutes later into the show, another truck driver—identified as "Karen"—calls the show to confirm the explanation of the first truck driver regarding the "missing time" and "missing town of Mojave."

"Karen": *Hi. About the "missing time." That previous lady caller took the words right out of my mouth.*
Art Bell: *You mean about the highway bypass?*
"Karen": *Yes. The same thing happened to me. I got 20 miles down the road before I realized, where's Mojave?*

And so, dear fellow skeptics, may I humbly ask for your support of Mr. Art Bell and his show? The man obviously does more to debunk his own claims of the paranormal than a dozen of us could do combined. He is so good, in fact, that his own listeners cannot take him. Consider the next caller on the same program. This time, Art talks to a male listener who is not identified by name:

Art Bell: *East of the Rockies, you are on the air! Hello.*
Caller: *Hey!*
Art Bell: *Hey.*
Caller: *About the "lost time."*
Art Bell: *Yes, sir.*
Caller: *Eh . . . one time, I drank two fifths of whiskey and I lost two days. . . .* □

FILL IN THE GAPS IN YOUR Skeptical Inquirer COLLECTION

• 15% discount on orders of $100 or more •

• $6.25 a copy, Vols. 1–18 ($5.00 Vols. 19–25). To order, use reply card insert •

MAY/JUNE 2004 (vol. 28, no. 3): Darkness, tunnels and light, *Woerlee* / Nurturing suspicion, *Mole* / The Cold War's classified Skyhook program, *Gildenberg* / The strange odyssey of Brenda Dunne, *Stokes* / Bridging the chasm between two cultures, *McLaren* / I am Freud's brain, *Garry and Loftus* / 'Visions' behind *The Passion*, *Nickell* / Belgium skeptics commit mass suicide, *Bonneux* / Psychic sleuth without a clue, *Nickell*.

MARCH/APRIL 2004 (vol. 28, no. 2): Special Issue: Science and Religion 2004: Turmoil and Tensions. Why is religion natural? *Boyer* / Skeptical inquiry and religion, Kurtz / Exorcising all the ghosts, *Edis* / The roles of religion, spirituality, and genetics in paranormal beliefs, *Kennedy* / Development of beliefs in paranormal and supernatural phenomena, *Whittle* / Religious beliefs and their consequences, Layng / Secularization: Europe yes, United States no, *Zuckerman* / Not too 'bright,' *Mooney* / Point of honor: On science and religion, *Haack* / Benjamin Franklin's Enlightenment deism, *Isaacson* / In praise of Ray Hyman, *Alcock* / Hoaxes, myths, and manias (report on the Albuquerque conference), *Frazier* / The stigmata of Lilian Bernas, *Nickell*.

JANUARY/FEBRUARY 2004 (vol. 28., no. 1): Anti-vaccination fever, *Hoyt* / Skepticism of caricatures, *Gaynor* / Fallacies and frustrations, *Mole* / Judging authority, *Lipps* / A geologist's adventures with Bimini beachrock and Atlantis true believers, *Shinn* / The real method of scientific discovery, *Guttman* / Oxygen is good—even when it's not there, *Hall* / Contemporary challenges to William James's white crow, *Spitz* / UFOs over Buffalo!, *Nickell*.

NOVEMBER/DECEMBER 2003 (vol. 27, no. 6): Ann Druyan talks about science, religion, wonder, awe, and Carl Sagan, *Druyan* / Less about appearances: Art and science, *Nowlin* / King of the paranormal, *Mooney* / Sylvia Browne, *Farha* / Neither intelligent nor designed, *Martin* / Fellowship of the rings: UFO rings vs. fairy rings, *Nieves-Rivera* / The curse of Bodie, *Nickell*.

SEPTEMBER/OCTOBER 2003 (vol. 27, no. 5): The ongoing problem with the National Center for Complementary and Alternative Medicine, *Atwood* / What does education really do?, *Lash, Tavani, Njoroge, Wilke, and McAuley* / Nostradamus's clever 'clairvoyance', *Yafeh and Heath* / They see dead people—Or do they?, *Underdown* / Energy, homeopathy, and hypnosis in Santa Fe, *Seavey* / Faking UFO photos for the twenty-first century, *Callen* / Haunted plantation, *Nickell*.

JULY/AUGUST 2003 (vol. 27, no. 4): Special Report: Chasing Champ: Legend of the Lake Champlain monster, *Nickell* / The measure of a monster, *Radford* / The Rorschach inkblot test, fortune tellers, and cold reading, *Wood, Nezworski, Lilienfeld, and Garb* / Can minds leave bodies?, *Bensley* / Memory recovery techniques in psychotherapy, *Lynn, Loftus, Lilienfeld, and Lock*.

MAY/JUNE 2003 (vol. 27, no. 3): The Luck Factor, *Wiseman* / More hazards: Hypnosis, airplanes, and strongly held beliefs, *Pankratz* / 'Premenstrual dysphoric disorder' and 'premenstrual syndrome' myths, *Flora and Sellers* / A patently false patent myth—still!, *Sass* / Wired to the kitchen sink, *Hall* / Mediumship claim responses, Schwartz and Hyman / Dowsing mysterious sites, *Nickell*.

MARCH/APRIL 2003 (vol. 27, no. 2): The Blank Slate, *Pinker* / Omission neglect: The importance of missing information, *Kardes and Sanbonmatsu* / Acupuncture, magic, and make-believe, *Ulett* / Walt Whitman, *Sloan* / The James Ossuary, *Nickell*.

JANUARY/FEBRUARY 2003 (vol. 27, no. 1): How *not* to test mediums, *Hyman* / Beliefs on trial, and the legality of reasonableness, *Fisher* / Placebos, nocebos, and chiropractic adjustments, *Homola* / Pliny the Elder: Credulist, skeptic, or both?, Parejko / Unfazed: Mark Twain debunks the mesmerizer, *Englebretsen* / Amityville Horror, *Nickell*.

NOVEMBER/DECEMBER 2002 (vol. 26, no. 6): Politicizing the Virgin Mary, *Eve* / Hypothesis testing and the nature of skeptical investigations, *Pigliucci* / Intelligent design: Dembski's presentation without arguments, *Perakh* / Hugo Gernsback, skeptical crusader, *Miller* / Alternative medicine and pseudoscience, *Mornstein* / Are skeptics cynical?, *Mole* / Psychic pets and pet psychics, *Nickell*.

SEPTEMBER/OCTOBER 2002 (vol. 26, no. 5): Special Report: Circular Reasoning: The 'mystery' of crop circles and their 'orbs' of light, *Nickell*, Fourth World Skeptics Conference Report / A skeptical look at September 11th, *Chapman and Harris* / Sheldrake's Crystals, *van Genderen, Koene and Nienhuys* / Teaching skepticism via the CRITIC acronym, *Bartz* / Skepticism under the big sky, *Schwinden, Engbrecht, Mercer and Patterson* / Why was *The X-Files* so appealing?, *Goode* / Winchester mystery house, *Nickell*.

JULY/AUGUST 2002 (vol. 26, no. 4): Special Report: Alternative medicine and the White House commission, *Gorski, London* / Special Section: Science and pseudoscience in Russia, *Kurtz, Efremov, Kruglyakov* / Who abused Jane Doe? Part 2, *Loftus and Guyer* / The high cost of skepticism, *Tavris* / Graham Hancock's shifting cataclysm, *Brass* / The Mad Gasser of Mattoon, *Ladendorf and Bartholomew* / Moscow mysteries, *Nickell*.

MAY/JUNE 2002 (vol. 26, no. 3): Who abused Jane Doe? Part 1, *Loftus and Guyer* / Is the Mars Effect a social effect?, *Dean* / Gray Barker's book of bunk, *Sherwood* / The king of quacks: Albert Abrams, M.D., Haines / Benny Hinn: Healer or hypnotist?, *Nickell*.

MARCH/APRIL 2002 (vol. 26, no. 2): Special Reports: Bioterrorism and alternative medicine, *Atwood* / 'Mothman' solved! *Nickell* / Bigfoot at fifty, *Radford* / Cripplefoot hobbled, *Daegling* / Pseudohistory in ancient coins, *Carrier* / Are science and religion compatible?, *Kurtz* / The emptiness of holism, *Ruscio* / Undercover among the spirits, *Nickell*.

JANUARY/FEBRUARY 2002 (vol. 26, no. 1): Myths of murder and multiple regression, *Goertzel* / Education, scientific knowledge, and belief in the paranormal, *Goode* / A university's struggle with chiropractic, *DeRobertis* / Snaring the Fowler: Mark Twain debunks phrenology, *Lopez* / Three skeptics' debate tools examined, *Caso* / Mickey Mouse discovers the 'real' Atlantis, *Hardersen* / Atlantis behind the myth, *Christopher* / 10th European Skeptics Congress report, *Mahner* / Voodoo in New Orleans, *Nickell* / Some thoughts on induction, *Gardner*.

NOVEMBER/DECEMBER 2001 (vol. 25, no. 6): A critique of Schwartz et al.'s after-death communication studies, *Wiseman and O'Keeffe* / Magical thinking in complementary and alternative medicine, *Stevens* / Educational malpractice, *Moore* / Philosophers and psychics: The Vandy episode, *Oldfield* / CSICOP 25th Anniversary section: The origins and evolution of CSICOP, *Nisbet* / Never a dull moment, *Karr* / John Edward: Hustling the bereaved, *Nickell* / Ernest Hemingway and Jane, *Gardner*.

SEPTEMBER/OCTOBER 2001 (vol. 25, no. 5): Special Issue: Science and Religion 2001. Holy wars, *Tyson* / The dangerous quest for cooperation between science and religion, *Pandian* / Design yes, intelligent no, *Pigliucci* / A way of life for agnostics?, *Lovelock* / Science, religion, and the Galileo affair, *Moy* / The god of falling bodies, *Stenger* / The relationship between paranormal beliefs and religious beliefs, *Sparks* / Science and religion in an impersonal universe, *Young* / Arthur C. Clarke's 'Credo,' *Clarke* / A designer universe?, *Weinberg* / An evolutionary-genetic wager, *Avise* / Shroud of Turin scandals, *Nickell* / Multiverses and blackberries, *Gardner*.

JULY/AUGUST 2001 (vol. 25, no. 4): Confronting veterinary medical nonsense, *Imrie* / Junk science and the law, *Dodes* / Chevreul's report on the mysterious oscillations of the hand-held pendulum, *Spitz and Marcuard* / CSICOP 25th Anniversary section: A quarter-century of skeptical inquiry, *Paul Kurtz* / Thoughts on science and skepticism in the twenty-first century, *Kendrick Frazier* / Proper criticism, *Ray Hyman* / The lighter side of skepticism, *Pudim* / A skeptical look at Karl Popper, *Gardner*.

MAY/JUNE 2001 (vol. 25, no. 3): The shrinking file-drawer, *Stokes* / The Pokémon Panic of 1997, *Radford* / The Antinous Prophecies, *Pickover* / Common myths of children's behavior, *Fiorello* / Bertrand Russell and critical receptiveness, *Hare* / CSICOP 25th Anniversary section: From the editor's seat: 25 years of science and skepticism, *Kendrick Frazier* / Science vs. pseudoscience, nonscience, and nonsense, *James Alcock* / CSICOP timeline / Primal scream: A persistent New Age therapy, *Gardner*.

MARCH/APRIL 2001 (vol. 25, no. 2): Darwin in mind, *Edis* / A bit confused, *Roche* / What can the paranormal teach us about consciousness?, *Blackmore* / Spontaneous human confabulation, *Nienhuys* / Italy's version of Harry Houdini, *Nisbet* / A psychological case of 'demon' and 'alien' visitation, *Reisner* / Distant healing and Elizabeth Targ, *Gardner*.

JANUARY/FEBRUARY 2001 (vol. 25, no. 1): Special Section: Issues in Alternative Medicine: Medicine wars, *Seidman* / Herbal medicines and dietary supplements, *Allen* / Psychoactive herbal medications, *Spinella* / Chiropractic, *Homola* / Damaged goods? Science and child sexual abuse, *Hagen* / Special Report: Science indicators 2000 / Facilitated communication, Gardner.

NOVEMBER/DECEMBER 2000 (vol. 24, no. 6): The face behind the Face on Mars, *Posner* / The new paranatural paradigm, *Kurtz* / Francis Bacon and the true ends of skepticism, *Friedberg* / Worlds in collision: Where reality meets the paranormal, *Radford* / Why bad beliefs don't die, Lester / Supernatural power and cultural evolution, *Layng* / The brutality of Dr. Bettelheim, *Gardner*.

SEPTEMBER/OCTOBER 2000 (vol. 24, no. 5): Voodoo science and the belief gene, *Park* / Rogerian Nursing Theory, *Raskin* / Sun sign columns, *Dean* and *Mather* / The psychic staring effect, *Marks* and *Colwell* / Management of positive and negative responses in a spiritualist medium consultation, *Greasley* / The laws of nature: A skeptic's guide, *Pazameta* / Special Report: On ear cones and candles, *Kaushall and Kaushall* / Little Red Riding Hood, *Gardner*.

JULY/AUGUST 2000 (vol. 24, no. 4): Thought Field Therapy: Can we really tap our problems away?, *Gaudiano and Herbert* / Absolute skepticism equals dogmatism, *Bunge* / Did a close encounter of the third kind occur on a Japanese beach in 1803?, *Tanaka* / Rethinking the dancing mania, *Bartholomew* / Has science education become an enemy of scientific rationality?, *Ede* / Krakatene: Explosive pseudoscience from the Czech Academy of science, *Slanina* / David Bohm and Krishnamurti, Gardner.

MAY/JUNE 2000 (vol. 24, no. 3): Special Report: The new bogus MJ-12 documents, *Klass* / Mass delusions and hysterias of the past millennium, *Bartholomew and Goode* / Doomsday fears at RHIC, *Guiterrez* / Save our science: The struggle for rationality at a French university, *Broch* / Paraneuroscience?, *Kirkland* / Bohm's guided wave theory, *Gardner*.

MARCH/APRIL 2000 (vol. 24, no. 2): Risky business: Vividness, availability, and the media paradox, *Ruscio* / Physics and the paranormal, *'t Hooft* / Efficacy of prayer, *Tessman and Tessman* / Can we tell if someone is staring at us?, *Baker* / Assessing the quality of medical Web sites, *Levi* / The demon-haunted sentence, *Byrne and Normand* / Mad messiahs, *Gardner*.

JANUARY/FEBRUARY 2000 (vol. 24, no. 1): Special Report: The ten outstanding skeptics of the twentieth century / Two paranormalisms or two and a half?, *Goode* / Anna Eva Fay, *Polidoro* / The pseudoscience of oxygen therapy, *Allen* / Confessions of a (former) graphologist, *Tripician* / The Second Coming of Jesus, *Gardner*.

For a complete listing of our back issues, call 800-634-1610, or see http://www.csicop.org/si/back-issues.html.

Science and Religion 2004

With perfect timing, the SKEPTICAL INQUIRER's excellent March/April special issue, "Science and Religion 2004: Turmoil and Tensions," came out just as the Supreme Court was preparing to discuss the case *of Elk Grove United School District* v. *Newdow* about the use of "under God" in the Pledge of Allegiance. I see the coincidence as significant, since the Newdow suit may indicate that atheists are increasingly willing to abandon the extreme tolerance they have traditionally adopted toward all forms of religionism.

The Dawkins-Dennett media campaign, recommending the use of the term *Brights* to designate religious unbelievers, may be considered another example of this welcome trend, but I am also in agreement with the criticism expressed by Chris Mooney in his article "Not Too 'Bright'." Yes, the campaign is both naive and counterproductive, but it adumbrates the realization that tolerating the intolerants is not only intellectually disreputable but also ethically reprehensible.

Thus, whether or not it is constitutional to use "under God" in the Pledge of Allegiance, it is important to highlight how unethical it is to let religionist agendas infiltrate public schooling at any level. In fact, a media campaign simply promoting the use of the term *religionism* to describe all types of theological belief would encourage this understanding, and may turn out to be a step in the . . . bright direction.

Liza Cerroni-Long
Ypsilanti, Michigan

While monitoring the ongoing science vs. religion debate, I've detected a hint of defensiveness, a whiff of guilt, within the sum of contributions from the scientific community, and this has produced some considerations I'd like to share.

Science vs. religion is a political battle fought mainly on the battlefield of journalism, a battle over who shall inform the masses on issues they deem critical. This battle is illusory. It is science that informs the masses on virtually all issues we deem critical. We may or may not pray for good crops, but we all use fertilizer, and when we break a leg, we go to the emergency room, not to church. It is our daily practical issues we deem most critical, and we consider spiritual issues at leisure. Science and religion are apples and oranges. Religion saves your unevidenced soul; sciences saves your ass.

Why then this debate? Religion has so far managed a masterful gambit of social politics by employing the time-honored strategy of achieving peer status with a superior foe by picking a fight with that foe. In the eyes of interested onlookers—the public—you will now seem a peer of your superior foe. Having pushed your way onto your opponent's stage, your argument may now be heard, and science will struggle in a public war of words with an opponent enjoying thousands of years' experience successfully selling to that same public a product to be taken solely on faith. For science, victory lies in its record.

By any accounting of discovery with resulting public benefit, the record of science beats that of religion hands down. Any sense of "battle" is illusory. The battle was decided long ago, and religion has been collectively backpedaling for centuries, fending off an endless series of scientific discoveries. . . .

Science need defend nothing, and should simply stand on its exceptional record, all the while practicing a tolerant and dignifying patience as it publicizes that record. Science is not responsible for any damage to any creed caused by new discoveries.

Perhaps with a chuckle for the Darwinian irony, science may be seen as the newest species of cosmic inquiry, having just evolved from its antecedent religion, while religion stands in danger of eventual extinction due to its difficulties adapting in pace to a changing social environment.

Martin Richer
Rocky Mount, North Carolina

This letter is prompted not by a specific article but by the general tenor of many recent articles, including the latest Science and Religion issue [March/April 2004]. Increasingly, the tone of the magazine seems to be out of touch with the important issues of the day. Surely, the critical issue today is the rise of religious fundamentalism. All fundamentalists, whether Christian, Islamic, Jewish, or Hindu, are aligned toward the common goal of eliminating rational thinking and free inquiry even as they fight each other. Against that background, stories about Bigfoot or haunted houses, which seemed important once, now appear merely quaint.

Even though the problem seems to be political, there are two important things that skeptics and the SKEPTICAL INQUIRER can do. In the first place, we must recognize that doublespeak is rapidly becoming, or has already become, the accepted mode of public discourse. Since such discourse creates our shared reality, its degradation is the most alarming development as regards the eventual prevalence of scientific reasoning. Thus skepticism must be applied to challenge instances of doublespeak by public figures.

Secondly, we must recognize that people of faith who seek to lead a moral life but not to impose their beliefs on others are needed allies against fundamentalism. (Who did not rejoice to hear President Carter's statement against the creationists of his home state?) Philosophical positions that brand all religious people as ignorant or somehow lagging on the developmental curve of humanity are not only arrogant but also serve to alienate the well-meaning faithful and perhaps push more of them into the arms of the fundamentalists. If we agree on how one should live, it seems trifling to disagree over why one should live that way. Rome is burning. Let us not fiddle.

Pantazis Mouroulis
Glendora, California

The March/April issue of the SKEPTICAL INQUIRER provides a very interesting variety of articles on science and religion, although it runs a little heavy in tilting at theological windmills and busting the phantasmagoria of religion.

I found of particular interest Anthony Layng's listing of the objective consequences of religion, both positive and negative. Also, I was impressed with the conclusion of Paul Kurtz's article, "Skeptical Inquiry and Religion," in which he urges the skeptical community to address the need for alternative

systems to religious ethics. The article by Walter Isaacson on "Benjamin Franklin's Enlightenment Deism" represents one man's step in this direction.

It would be nice to have an issue of SI devoted to listing the positive social functions of religion in a secular society and the basis for a rational or scientific ethics.

David W. Briggs
Augusta, Maine

This issue [March/April 2004], as most issues of SI, was interesting and worthwhile. I have been a subscriber since about 1983. I have been a weekly churchgoing Christian all my life (I'm now 65). I have appreciated SI for helping me understand how to think about various things rather than telling me what to think.

Regarding religion, I cannot give it up. One reason, I suppose, is that I very much appreciate living in a country which has religious freedom and cannot see its value if no one actually practices it. I think the multiplicity of religions is a strength rather than a weakness. Another reason falls in the area of Pascal's Wager: In the game of life, it's better to bet there is a God, since if I am wrong I've lost little, but if I'm right I've gained a great deal.

Lynn R. Heath
lynnheath@linkline.com

Susan Haack's Point of Honor

Susan Haack ("Point of Honor: On Science and Religion," March/April 2004) is right to say that the question of science and religion is a tangle. This is not only because religious belief is complex but also because what science tells us about the world is far from clear. Haack criticizes Swinburne for not being troubled by quantum indeterminacy. Quantum mechanics isn't kind on anyone's belief system. What is usually taught to physicists is a mix of materialism and idealism, opportunistically switching from one to the other as the situation requires. If one tries to give a coherent account of it, one is led into strange and radically different visions of the world, all of which conform to the empirical facts. A good account of this tangle is given by J. Baggott (*The Meaning of Quantum Theory*, Oxford University Press, 1992). Attempts to give a rational account of quantum theory even led Baggott to consider, among other things, the existence of God, which is "after all, no less metaphysical or bizarre than some of the other possibilities we have considered so far." Questions about God inevitably lead to questions about the nature of reality, but as W. Rindler said (*The American Journal of Physics*, vol. 62, no. 10, p. 887, 1994) "physical theories do not tell us what nature *is*, only what it is *like*."

Guy Potvin
Val-Bélair, Québec
Canada

Congratulations on another tremendous Science and Religion issue. Every article was engaging and insightful. I would, however, like to comment on Susan Haack's interpretation of Stephen Jay Gould's concept of "nonoverlapping magisteria." While she does not speculate on Gould's "motives," she mentions H.L. Mencken's suggestion that cowardice or inner doubt likely serve as stimuli for the reconciliation of science and religion.

I submit that Gould was simply acting, as usual, as an ambassador for science. As a prolific science writer, Gould understood that the institution of science must become more inclusive. Far too many Americans are scientifically illiterate, allowing pseudoscience and superstition to metastasize in popular culture. If required to choose between science and religion, few would align themselves with science. A middle ground provides religious-minded folk the opportunity to engage in critical thinking and inquiry-based learning, while demonstrating the benefits of tolerance and patience to those of us more skeptical.

As a science educator, I subscribe to the notion that course content should flow from the concrete to the abstract, from descriptive explanations to quantitative explanations. Along those lines, if we first demonstrate that science and religion are not "at odds," we alienate fewer people. Only then can we give them the gift of skeptical inquiry. Like Gould, I think that all people can relate to science on some level. We simply have to open the door.

Shawn Stover
Assistant Professor of Biology
Davis & Elkins College
Elkins, West Virginia

"Hypothesis testing" criteria seem rather prosaic in responding to Susan Haack's admonition "... to reconcile science and religion" ("Point of Honor: On Science and Religion," March/April 2004). And yet the null (God-does-not-exist) hypothesis is no more certain in the absolute sense (i.e., can't prove it) than is the alternative (God-exists) notion. Ironically, theists, deists, *and atheists* have something in common—they all claim absolute truth regarding the existence of God. Such certitude is antithetical to scientific analysis.

Bayesian analysis, a tactic compatible with agnosticism, would calculate probabilities for each position. And no matter how abundant the empirical evidence accumulated in support of the God-does-not-exist hypothesis, rejection of the null hypothesis would be a possibility, though minuscule.

An analogous case in physical science involves Albert Einstein, who expressed serious doubts regarding later developments of quantum theory which today seem to fit the experimental data. According to Walborn et al., "He could not come to terms with the idea that what we observe and consequently call 'reality' seems to be random. (Quantum mechanics deals with probabilities and therefore does not say anything about where the photon is; only where it is *likely* or *unlikely* to turn up.)" ("Quantum Erasure," *American Scientist*, July-August 2003, p. 338.)

In sum, scientists should resist efforts to exempt religious hypotheses *a priori* from their realm of study, despite the fact that proponents of religion use unscientific arguments often in attempts to justify them. Moreover, reconciliation of science and religion does not necessarily require scientists to adopt or endorse questionable procedures for testing hypotheses. Nevertheless, let us not "throw out the baby with the wash water."

William F. Vitulli
Emeritus Professor of Psychology
Department of Psychology
University of South Alabama
Mobile, Alabama

In the interest of accuracy, I must point out that in her article in SI (March/April 2004), Susan Haack unwittingly perpetuates an error of fact. She cites an article by H. Irvin Smith in the *Wall Street Journal* mentioning "the 'exquisitely numbered' Leviticus 20:20 against allowing people with imperfect eyesight to approach the altar." It makes a good story, but unfortunately, the relevant verse is Leviticus 21:20.

Faith W. Eckler
Morristown, New Jersey

(Susan Haack's response will appear in the next issue. Ed.)

Religion Natural?

Although Pascal Boyer ("Why Is Religion Natural?" March/April 2004) makes a good case that religious beliefs use patterns of thought that occur in many other contexts, he fails to show that "sleep of reason" is not occurring. The fact is that believers are applying these "natural" patterns in ways that indeed are unreasonable.

He notes that "there are profound individual differences in the extent to which [people] . . . adhere to religious concepts." So the interesting question is why some choose to set reason aside when thinking about these concepts while others do not.

John G. Fletcher
Livermore, California

Is there a simple answer to the question in the March/April issue, "Why Is Religion Natural?"

In daily living people find dissatisfaction in this real world, in things such as: disasters, sickness, failure, love loss, and mortality. Thus to escape, they set about creating a more comfortable new world ruled by mythical gods and spirits that can be manipulated with prayer, ritual, and worship to help achieve human goals.

The rub comes when two such supernatural systems collide. Since neither is based on rational, testable, real-world propositions, the only recourse is to fight.

Harold Trautman
Portland, Oregon

Secular Europe

I fear your article comparing secular Europe with the nonsecular U.S. is a little too optimistic.

In the U.K., we secularists in the National Secular Society and the British Humanist Association thought we had been making progress in rolling back the influence of the church, especially with many in the Church of England supporting its disestablishment. But then we got Blair the Anglo-Catholic, Chancellor Gordon Brown the son of the Manse, and David Blunkett, a Home Secretary who is a believer with distinct authoritarian tendencies. (We have our own mini-Guantanamo in Belmarsh prison, though all those imprisoned without trial may leave the country if they can find another one to take them.) To put the lid on it, the census of 2000, in a badly phrased question, showed that 71 percent of the people thought they were Christian, completely confounding all previous polls.

After a botched attempt to reform the House of Lords, we still have an Upper House in which twenty-six bishops (and ninety-odd hereditary peers) are entitled to sit as of right, and if any new initiative takes off to continue the reforms, it is already clear that (a) Blair the "democrat" wants an entirely appointed chamber and (b) other "faith communities" will be given places also as of right—but not representatives of the BHA or NSS. Imagine the outbreak of interfaith strife, with liberal Jewry demanding representation alongside orthodox, Shia vying with Sunni . . . to satisfy everybody, the entire upper chamber wouldn't be enough.

Last year, there was a quiet mention in a ministerial answer to an MP's question that the government was setting up a faith-community consultative committee to work on approaches to government legislation. I discovered this in my weekly trawl of the Parliament Web site. Naturally, neither the NSS nor the BHA were invited, though they have since been conceded separate single meetings with the minister.

And the growth in the number of "faith" schools continues. The church or mosque need only find 10 percent (sometimes less) of the capital cost of a faith school while the state finds the rest and the running costs. A recent scandal involved a so-called City Academy in the north of England started by an evangelical who has made millions selling cars. In this school, each pupil is required to carry around two Bibles (different translations) and is taught creationism alongside evolution (which is, of course, only another theory and is there only because of the national curriculum). Complaints to Blair were received with a shrug; the latest is that the car salesman is soon to open another four or five academies on the same lines. . . .

In the U.K., we have no constitution that protects us from these follies—indeed, what constitutional framework there is works on the presumption that the church is everywhere and ought to be everywhere.

The European Union is at present struggling to put together a constitution, and the current draft, with one exception, is firmly secular (thanks to the French and Germans). The exception is in article 51, which, in its first two clauses, affirms religious freedom (no quarrel there), but then goes on to say in effect that religious communities will have privileged consultation about future legislation. We are fighting to get this removed, but on top of that, the churches are trying to get Christianity mentioned in the general preamble on the grounds that this blight has been part of the cultural history of Europe for centuries. . . .

At least the U.S. has a constitution, though I appreciate that no piece of paper can protect you against well-supported corporate gangsters who are willing to trample on or ignore any constitutional restraints.

Barry Thorpe
Heald Green
U.K.

In attempting to explain why Europe is more secular than the U.S., Phil Zuckerman says, "Perhaps when the government takes a greater role in providing social services, religion wanes, and when the government fails to provide extensive social services, religion thrives."

He has this backwards. Religion satisfies many needs, and because atheists have these same needs, they turn to the best substitute they have for religion: socialism. Because all the countries of Europe are secularist, they all are now socialist, even though socialism does a poor job of providing social services. Time and again, socialism has been proven not to work, but many still believe in it. It is the most popular pseudoscience of the intelligentsia and of Hollywood celebs, even more popular than Dianetics or Orgone boxes. . . .

Robert Abbott
Jupiter, Florida

I don't know why the big question about the discrepancy in belief. Do churches in Europe get the big, fat tax break American churches do? Take money out of the equation and I'll bet it would be the same here as in Europe—real low! Sometimes we don't see the forest for the trees.

Tom Denkinger
St. Paul, Minnesota

Phil Zuckerman responds:

In response to Thorpe: Most interesting information. And potentially disquieting. Keep up the struggle!

In response to Abbott: "All the countries of Europe" are not "socialist"—at least according to standard/typical criteria. They all allow for

the private ownership of much of the means of production, as well as economic competition, profit motive in commerce, consumer choice, etc.

What you simply have in Europe are capitalist/democratic countries with advanced, rational, and humane social welfare policies. Taxes go to support schools, hospitals, the disabled, the elderly, the arts, the orphaned, etc. The nations of Europe have low murder rates, high literacy rates, low infant mortality rates, low poverty rates, low homeless rates, excellent child care, the highest gender equality in government and industry in the world, thriving multi-party, proportionally-representative governments, excellent public transportation, excellent environmental protection legislation, humane prisons, admirable maternal/paternal paid leave policies, low rates of teenage pregnancy, rational drug laws—the list goes on and on. The question I was seeking to proposing for consideration is simply this, what came first: secularization and then sane/rational social welfare programs, or sane/rational social welfare programs and then secularization?

As for tax breaks? That's nothing. In most European nations during the last two centuries, churches not only got "tax breaks" but they were completely subsidized by the government. The pastor's salary was paid by the state! The wood for the pews, the plaster for the walls, and the cost of electricity were all *paid by the state! Throughout Europe, religion was (and in many cases, still is!) actively supported financially by the government. I'm not exactly sure just what forest you're looking at, or what trees.*

Not Too Bright?

In reference to the furor created by Richard Dawkins and Daniel Dennett in proposing the term *Brights* in place of *atheists* (as covered by Chris Mooney's article, "Not Too 'Bright'" in the March/April 2004 issue of SKEPTICAL INQUIRER), I would like to humbly suggest an alternative term: *philosophically correct* or *PhC.*

While I agree with Mooney that ideally a campaign of "market research" would be required before deciding on a term, I feel *philosophically correct* is a natural choice. Following on the heels of *politically correct* (which in turn was born as an extension of *anatomically correct*), it would have a familiar ring to it, making it more accessible to "consumers." But unlike *politically correct* (a term I object to), it can be defended—atheists (ugly word) are "correct" in the sense that they don't want to make conclusions without evidence. Ultimately, the atheist position is that "OK, God may exist, but to adopt that stance without proof is incorrect." *So philosophically correct* would be perfectly defensible as well as being (fairly) modest, and it would follow on from a familiar predecessor.

How about it?

Adrian Boyle
Tokyo, Japan

It's a shame that the *Brights* meme was implemented and has failed so miserably. Even as Dawkins explained that the word *Bright* does not necessarily mean clever or intelligent—it was akin to having to explain the punch line of a joke . . . and if you have to explain it. . . . While reflecting on this tragedy in the days that followed my reading of the word, I awoke from a dream one morning with a word that seemed to capture what Paul Geisert and Mynga Futrell were trying to capture. An impetus with the potential to carry the sublime, ephemeral sparks of nature unfolding. Ready? The word is *Bloom.* The *Bloomers* or the *Blooms* for short. Yes, the image of a flower. Natural. Beautiful. Humble. Bad connotations? Could it get any worse?

Perhaps SI could run a contest to see who could come up with a more functional word. Consider this my entry. Thanks and keep up the great writing!

Andrew Viceroy
Portland, Oregon

Chris Mooney's analysis of the current "flap" over the adoption of the noun *Bright* to identify persons without dogmatic religious beliefs is grossly off point. The mistaken idea that adopting a less confrontational, less easily misconstrued term than *Bright* will ameliorate the intolerance of narrow-minded religious bigots is myopic. Being meek and talking "nice" to people of this ilk has accomplished nothing.

Look closely at the history of antislavery, female suffrage, segregation, voting rights, reproductive rights, gender equality, and gay rights. Nothing positive was accomplished in any of these venues until the proponents actively, and aggressively, engaged their opponents. The same will be true in this case also.

Just because the religious right is too ignorant to understand what the noun *Bright* means, and what it does not mean, is simply a reflection on them, not on *Brights.* Because they insist on being insulted or demeaned by unbelievers using that term says something negative about them, not about the unbelievers.

In short, you will never change the minds of the "true believers," but if you raise enough hell (pun intended) with a good case, you can positively influence all those who are willing to listen.

George Kalis
Brooklyn, Michigan

The considerable discussion about the appropriateness of *Bright* as a term to replace *atheist* suggests that the time is ripe to explore another naming issue, and that is our continued, automatic reference to God in the universal sense.

When we write articles about the belief or lack of belief in God, or when we discuss with theists whether God does or does not exist, our position becomes set to the defensive by verbally accepting God as a universal entity that has to be argued away. When you ask a theist to prove that God exists, you are complicit in accepting the concept's generality.

Would it not be better to put the theist on the defensive by verbally challenging their right to automatically extend their personal belief into your domain? Wouldn't it be more to the point to require a theist to prove that their God exists? Wouldn't we then be on a more solid footing to discuss in an article or letter to the editor whether or not a God exists in some believer's personal rather than general universe?

Roll the idea around. Try it out a few times. I always refer to a personal deity in arguments. Believe me, it drives the theist crazy. "What do you mean *my* God?" they exclaim, and then the game's afoot.

David Werdegar
Naperville, Illinois

Stigmatist: Nothing Miraculous

I was glad to read Joe Nickell's report on the stigmatist Lilian Bernas [March/April 2004]. I found it informative, balanced, and even showing great restraint. Lilian visited my Catholic high school. Despite the fact that I am a devout Catholic, I found Lilian's claims and the photos that she provided of one of her miraculous sufferings disturbing.

I found several questionable things in the photos that were also consistent with fraud rather than something supernatural. The spear

wound on her side was much wider than any Roman spear tip that I am familiar with. She didn't answer the question of why her wound was on her left side when other stigmatists, works of art, and even the Bible (John 19:34) suggest it should be on the right side. She distributed photos that showed something that resembled the head of a nail or spike extending up from her palm, yet it was about two inches further up the palm, near the fingers, than the exit wounds she bears on the backs of her hands. I saw nothing miraculous in these photos. (To be sure, I sent copies of the photos to Joe.)

I am glad that CSICOP investigates purported supernatural events. Since Christians are encouraged several times in the Bible to think skeptically and be wary of miraculous claims (Jeremiah 29:8, Matthew 24:4, James 1:16, 1 John 4:1), I'm glad there are unbiased, professional investigators on the job. That's one of the many reasons why I subscribe to your fine magazine.

Well done, Joe.

John Zachritz
Buffalo, New York

This whole thing about stigmata is ridiculous. From the beginning, the "victims" have exhibited the wounds in the wrong places.

Any nails driven through the palms of the hands would pull right through the knuckles of the fingers due to the weight of the body.

In a crucifixion, the nails were placed proximal to the carpals and between the ulna and the radius.

Mary Louise Thompson
San Antonio, Texas

Sources of Knowledge

In the letters section of the March/April 2004 SKEPTICAL INQUIRER, reader Don Keith advances the claim that science is the only way that humans come to know the world. He then poses the following challenge: "Can you or any of your readers offer any method of inquiry at all, other than science, that generates knowledge of the world?"

Well, there have been many answers to this question throughout the history of philosophy. Here I will merely revisit the first and perhaps simplest schema of the ways of knowing, that offered by Aristotle.

According to Aristotle, there are three basic ways of coming to know. First, there is scientific logic, which allows us to develop inferences regarding issues that can be known with certainty (in fields such as physics and mathematics). It is this way of knowing that may properly be considered the precursor of scientific method. Second, there is dialectic (i.e., philosophical argument), which allows us to develop inferences regarding issues that are generally true but can only be known with probability (in fields such as ethics and politics). Finally, there is rhetoric, which allows us to develop inferences that are contingent—they depend on many other matters that, in turn, can only be known with probability. Such inferences guide decisions in the realm of praxis (i.e., practical action).

To suggest that science is the only way of knowing is to relegate all discussion of values, culture, literature, and all practical matters to the realm of the unknowable and irrational, and no one could live a meaningful life under such assumptions. As skeptics, science may stand as our ideal, but we live in a world with many ethical, political, and practical exigencies. It would be a grand mistake to suggest that careful reasoning, evidence, and the tests of critical thinking—the cornerstones of both dialectic and rhetoric as Aristotle conceived them—have nothing to offer us in dealing with these exigencies. To assert that science is the only way of knowing and that science is all that can be known is to commit precisely this error.

Peter Marston
Professor
Communication Studies
California State University
Northridge, California

In the letters column of SI [March/April 2004], Massimo Pigliucci responds with gusto to critics of his warning about the dangers of scientism. Many fervent admirers of science will agree with him at least in part, as will others who are not religious believers, dualists, or advocates of spiritual entities (though there are still some well-informed dualists). But he might have placed more emphasis on those critical, rational, and intellectually viable domains where science has less input and where scientism is thus most damaging. (These are also, and more predictably, ignored by his critics.)

These include logic and related *a priori*stic subjects, but most notably philosophical domains such as metaethics, the theory of the status of ethical propositions (as opposed to the origins and neuropsychology of ethical ideas, which are, of course, a proper field for increasingly successful scientific enquiry).

In some of these areas, it is by no means clear that other, nonscientific approaches can ever actually resolve the queries; but (*pace* some critics) the idea that science itself will eventually do so often appears seriously implausible.

However, the crucial blow to scientism as a universal theory of valid knowledge comes from its own slogans, which are self-confounding. The statement that only scientific statements can be valid is itself not a scientific statement.

Mark Newbrook
Heswall, Wirral
U.K.

Brain Design?

While readers gripe about our poorly designed lungs, jerry-rigged windpipe/food pipe, and critique the male urethral arrangement (Letters, "Intelligent Design? Not!" March/April 2004), they conveniently overlook the most superbly structured organ in the known universe: the human brain.

How ironic to use this most complex of organs to mock the body in which it resides. Would any of your readers care to point out some flaws in the human brain? Can you really blame Intelligent Design proponents for thinking that our brains were designed? Scientists have yet to design even a "simple" life form from non-living matter. Our brain, and life itself, should humble every evolutionist. A person doesn't have to believe that the guiding hand of a Creator made life in order to appreciate the wondrous "design" in us all and in all living things.

April Pedersen
Reno, Nevada

Neuroscientists among our readers: Want to respond?—EDITOR

Professor Challenger

Steve Chandler (Letters, March/April 2000) wonders if Conan Doyle ever involved Sherlock Holmes with spiritualism. No, but Professor Challenger, another larger-than-life character of his, is converted to spiritualism in *The Land of Mist* (1926). Most of us remember the quarrelsome and tough-minded professor from *The Lost World*, Doyle's novel of dinosaurs and other prehistoric survivals on a plateau in South America.

but Challenger goes soft in the head in the *Land of Mist*, though not to the point of endorsing fairy photographs like Doyle.

John Alfred Taylor
Washington, Pennsylvania

Absurd Hampton 'Ghost'

Even if science couldn't entirely disprove the alleged "ghost" in the Hampton Court photograph [News and Comment, March/April 2004], common sense certainly can. So-called ghosts are ectoplasmic creatures having no substance. That being so, why would the Hampton Court ghost need to open the door? Why not just walk through it? How can an ectoplasmic creature with no substance wear a robe? What's going to hold it up? For that matter, why would a ghost even need to wear a robe? Do ghosts get cold? Was the robe a fashion statement? Unfortunately, neither science nor common sense will ever convince some people of the absurdity of their claims.

Dave Gardner
Seattle, Washington

Shroud Not Hoax, Not Miracle

Editor's note: The following letter, from a former Shroud of Turin researcher, was stimulated by an early electronic distribution by CSICOP of Joe Nickell's "'Secrets of the Dead' Buries the Truth about Turin Shroud," published in this issue.

With regard to the Shroud of Turin, one thing I learned was that humanity's bell-shaped curve is really upside down: everyone is on one of the lunatic fringes and nobody is in the middle.

But how about some facts?

1) X-ray fluorescence, visible/UV spectra, and chemical analyses proved that the image is not a high-Z pigment.

2) The blood is real blood, but the things you hear about typing are nonsense.

3) The image was not produced by radiation. There are no defects in the cellulose crystals.

4) The image color is in a 200–500-nanometers-thick amorphous surface layer.

5) The image spectrum looks like a Maillard product; i.e., the products that form when you bring reducing saccharides (e.g., starch) into contact with the amine decomposition products of a rotting body. No miracles or painters are required.

6) The radiocarbon sample is dyed with a gum/dye/mordant system containing madder root dyes. The rest of the cloth is not. It was a medieval patch.

7) Lignin decomposition kinetics show that it would have taken between 1300 and 3000 years to reach the composition observed.

8) I found a medieval splice in the sampling area.

The worst science I have ever seen has appeared around the shroud; however, let's be honest about our science, even when it seems to support the religious zealots.

Raymond N. Rogers
Fellow
Los Alamos National Laboratory
Los Alamos, New Mexico

Joe Nickell responds:

Disavowing the claims of many shroudologists that the image on the cloth was produced by a miraculous burst of radiation from Christ's resurrection, Rogers commendably goes even further to distance himself from a "science" of miracles.

He suggests that the image stain is the result of byproducts from "a rotting body." However, in so doing he is endorsing the long-ago discredited "contact theory." It held that some substance(s) on the putative body (e.g., sweat, oils, spices, etc.) had transferred to the cloth by simple contact. Unfortunately, several factors—including the lack of severe wraparound distortions, and the fact that not all of the imprinted areas would have been touched by a simple draped cloth—argue against this scenario. So does the fact that no burial cloth in the history of the world has had such pictorial images of "body" and "blood."

Following others' failed attempts to debunk the radiocarbon date, Rogers states as fact—but is really only hypothesizing—that the cloth sample was from a "patch" that he divines as "medieval" (apparently by appealing to the radiocarbon results). As to dating "the rest of the cloth" by the amount of lignin decomposition, Rogers admits that method can offer only an accuracy range of a whopping 1,700 years (contrasted with the 150 years with radiocarbon testing), and the decomposition could have been greatly accelerated by the baking of the cloth that occurred during the fire of 1532.

While Rogers concedes that claims of type-AB blood being found on the cloth are "nonsense," he stubbornly defends the notion that the suspiciously bright red and neatly transferred stains are blood. That they are not was confirmed by numerous tests conducted by forensic serologists, revealing an absence of corpuscles or other identifiable blood components. Tests highly sensitive to minute traces of hemoglobin and hemoglobin derivatives were negative, as were attempts to speciate, type, or otherwise identify the "blood" as such. Thin-layer chromatography and neutron activation analysis were also negative for blood.

In fact, the entire image was rendered in collagen-tempera paint, its presence positively established by Walter McCrone, one of the world's foremost microanalysts. The details—complete with photomicrographs of pigment/medium agglomerates and the results of confirmatory analyses—are reported in his book, Judgment Day for the Turin Shroud *(Prometheus, 1999). The presence of vermilion (mercuric sulfide) was confirmed also by scanning electron microscopy with energy-dispersive X-ray analysis, electron-microprobe analysis, and both X-ray and electron diffraction; mercury was further confirmed by a highly sensitive microchemical test.*

The Shroud of Turin Research Project (STURP), of which McCrone was the only expert in the identification of pigments, held him to a secrecy agreement, while making statements to the press indicating there was no evidence of artistry. McCrone was then, he says, "drummed out" of STURP. As STURP tried to discredit him and his findings, he called for future shroud research to put his conclusions "to an independent check by someone trained in the microscopy of paintings." Instead he continues to be vilified by those who—incompetent in McCrone's field—refuse to accept that science and scholarship have proven the "shroud" a medieval forgery.

The letters column is a forum for views on matters raised in previous issues. **Letters should be no more than 225 words.** Due to the volume of letters not all can be published. Address letters to Letters to the Editor, SKEPTICAL INQUIRER. Send by mail to 944 Deer Dr. NE, Albuquerque, NM 87122; by fax to 505-828-2080; or by e-mail to letters@csicop.org (include name and address).

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION
OF CLAIMS OF THE PARANORMAL

AT THE CENTER FOR INQUIRY–*INTERNATIONAL* (ADJACENT TO THE STATE UNIVERSITY OF NEW YORK AT BUFFALO)

AN INTERNATIONAL ORGANIZATION
Network of Affiliated Organizations
International

AUSTRALIA. *Canberra Skeptics*, *Canberra Australia.* Peter Barrett, President. PO Box 555, Civic Square ACT 2608 Australia. **Australian Skeptics Inc.,** Australia. Barry Williams, Executive Officer. Tel. 61-2-9417-2071; e-mail: skeptics@kasm.com.au. PO Box 268, Roseville NSW 2069 Australia. www.skeptics.com.au. ***Australian Skeptics*—***Hunter Region* Newcastle/Hunter Valley. Dr. Colin Keay, President. Tel.: 61-2-49689666; e-mail: bolide@hunterlink.net au. PO Box 166, Waratah NSW 2298. **Australia Darwin Skeptics,** Northern Territory, Australia. Simon Potter, Secretary. Tel.: 61-8-8932-7552; e-mail: dwnskeptic@ais.net.au. PO Box 809, Sanderson NT 0812 Australia. **Gold Coast Skeptics,** Queensland, Australia. Lilian Derrick, Secretary. Tel.: 61-7-5593-1882; e-mail: lmderrick@telstra.easymail.com.au. PO Box 8348, GCMC Bundall QLD 4217 Australia. **Queensland Skeptics Assoc. Inc.** (Qskeptics) Queensland. Bob Bruce, President. Tel.: 61-7-3255-0499; e-mail: qskeptic@uq.net.au. PO Box 6454, Fairview Gardens QLD 4103 Australia. **South Australia Skeptics (SAS)** South Australia. Mr. Laurie Eddie, Secretary. Tel.: 61-8-8272-5881; *e-mail: allang@txc.net.au. PO Box 377, Rundle Mall* SA 5000 Australia. **Australian Skeptics in Tasmania Inc.,** Tasmania, Australia. Fred Thornett, Secretary. Tel.: 61-3-6234-1458; e-mail: fredthornett@hotmail.com. PO Box 582, North Hobart, TAS 7000 Australia. **Australian Skeptics**—Victorian Branch *Victoria. Christopher Short, President. Tel.: 613-*1800-666--996; e-mail: contact@skeptics.com.au. GPO Box 5166AA, Melbourne VIC 3001 Australia. www.skeptics.com.au. **WA Skeptics,** Western Australia. Dr. John Happs, President. Tel.: 61-8-9448-8458; e-mail: wa.skeptics@australiamail.com. PO Box 899, Morley, WA 6062 Australia.

BELGIUM. Comité Belge Pour L'Investigation Scientifique des Phénomènes Réputés Pananormaux Comité Para, Belgium. J. Dommanget, President of the Committee. E-mail: omer.nys@oma.be. Observatoire Royal Belgique 3, ave. Circulaire B-1180, Brussels, Belgium. www.comitepara.be. **Studiekring voor Kritische Evaluatie van Pseudowetenschap en Paranormale beweringen** (SKEPP) Belgium. Prof. Dr. W. Betz. Tel.: 32-2-477-43-11; e-mail: skepp@skepp.be Laarbeeklaan, 103 B-1090 Brussels, Belgium. www.skepp.be

BRAZIL. Opçao Racional, Brazil. Luis Fernando Gutman. Tel.: 55-21-548-2476; e-mail: fernandogutman @hotmail.com. Rua Santa Clara, 431 Bloco 5, Apt. 803, Copacabana-Rio de Janeiro 22041-010 Brazil. www.opcaoracional.com.br.

BULGARIA. Bulgarian Skeptics, *Bulgaria. Dr. Vladimir* Daskalov. E-mail: egoshev@einet.bg. Krakra 22 BG-1504 Sofia, Bulgaria.

CANADA. Alberta Skeptics, Alberta. Greg Hart, Chairman. Tel.: 403-215-1440; e-mail: hartg@humaneffort.com. PO Box 5571, Station 'A', Calgary, Alberta T2H 1X9 Canada. http://abskeptics.homestead.com. **Alberta Skeptics, British Columbia Skeptics,** BC and Alberta. Lee Moller. Tel. 604-929-6299; e-mail: lee moller@shaw.ca. 1188 Beaufort Road, N. Vancouver, BC V7G 1R7 Canada. **Ontario Skeptics,** Ontario, Canada. Eric McMillan, Chair. Tel.: 416-425-2451; e-mail: eric@we-compute.com. P.O. Box 554 Station "P" Toronto, ON M5S 2T1 Canada. www.astro.yorku.ca/~mmdr/oskeptics.html. **Toronto Skeptical Inquirers** (TSI) Toronto. Henry Gordon, President. Tel.: 905-771-1615; e-mail: henry_gordon@hotmail.com. 343 Clark Ave., W., Suite 1009, Thornhill, ON L4J 7K5 Canada. **Ottawa Skeptics,** Ottawa, Ontario. Greg Singer. E-mail: skeptic@ottawa.com. PO Box 1237, Station B, Ottawa, Ontario K1P 5R3 Canada. www.admissions.carleton.ca/~addalby/cats/skeptic.html. **Sceptiques du Quebec,** Quebec. Alan Bonnier. *Tel.: 514-990-8099. C.P. 202, Succ. Beaubien Montreal,* Quebec H2G 3C9 Canada. www.sceptiques.qc.ca. **Skeptics Quinte,** Bill Broderick. 2262 Shannon Rd. R.R. 1, Shannonville, ON K0K 3A0; e-mail: broderic @kos.net.

CHINA. China Association for Science and Technology, China. Shen Zhenyu Research Center, P.O. Box 8113, Beijing China. **Hong Kong Skeptics,** Hong Kong. Brad Collins, P.O. Box 1010, Shatin Central Post Office, Shatin NT China.

COSTA RICA. Iniciativa para la Promoción del Pensamiento Crítico (IPPEC) San Jose. Victor Quiros V. Tel.: 506 275 43 52; e-mail: victorcr@racsa.co.cr. A.P. 1513-1002 Paseo de los Estudiantes San José, Costa Rica. http://webs.demasiado.com/vicr.

CZECH REPUBLIC. Sisyfos-Czech Skeptics Club. *Czech* Republic. Ms. Ing. Olga Kracikova, Secretary. Tel.: 420-2-24826691; e-mail: olgakracikova@email.cz. Hastalska 27 Praha 1 110 00 Czech Republic. www.fi.muni.cz/sisyfos/ (in Czech).

DENMARK. Skeptica: Association of Independent Danish Skeptics, Denmark. Willy Wegner. Tel.: 45-75-64-84-02; e-mail: skeptica@skeptica.dk. Vibevej 7 A DK 8700 Horsens, Denmark. www.skeptica.dk.

ECUADOR. Prociencia, Peter Schenkel, PO Box 17-11-6064 Quito, Equador. Tel.: 593-2-226-8084; e-mail: *schenkel@ecnet.ec.*

ESTONIA Horisont. Indrek Rohtmets. EE 0102 Tallinn, Narva mnt. 5.

FINLAND. SKEPSIS, Finland. Jukka Hakkinen. PO Box 483, Helsinki 00101 Finland.

FRANCE. AFIS, AFIS (Association Française pour *l'Information Scientifique) France. Jean Bricmont,* President. 14 rue de l'Ecole Polytechnique F-75005 Paris, France. **Cercle Zététique,** France. Paul-Eric Blanrue. 12 rue; David Deitz. F-57000 Metz, France. **Laboratoire de Zététique** (laboratory). Professeur Henri Broch. Tel.: 33-0492076312; e-mail:broch @unice.fr. Université de Nice-Sophia Antipolis Faculté des Sciences F-06108 Nice Cedex 2 France. www.unice.fr/zetetique/.

GERMANY. Gesellschaft zur wissenschaftlichen Unterrsuchung von Parawissenschaften (GWUP) Germany. Amardeo Sarma, Chairman. Tel.: 49-6154-695023. E-mail: info@gwup.org. Arheilger Weg 11 D-64380 Rossdorf, Germany. www.gwup.org. **European Council of Skeptical Organizations** (ECSO) Europe. Dr. Martin Mahner. Tel.: 49-6154-695023; e-mail: info@ecso.org. Arheilger Weg 11 64380 Rossdorf, Germany. www.ecso.org/.

HUNGARY. Tényeket Tisztelk Társaság TTT Hungary. Prof. Gyula Bencze. Tel.: 36-1-392-2728; e-mail: gbencze@rmki.kfki.hu. *c/o Természet Világa,* PO Box 246 H-1444 Budapest 8 Hungary.

INDIA. Atheist Centre, Dr. Vijayam, Executive Director. *Benz Circle, Vijayawada 520 010, Andhra Pradesh,* India. Tel.: 91 866 472330; Fax: 91 866 473433. E-mail: atheist@vsnl.com. **MaharashtraAndhashraddha Nir moolan Samiti** (MANS) states of Maharashtra & Goa. Dr. Narendra Dabholkar, Executive President. Tel.: 91-2162-32333; e-mail: ndabholkar@hotmail.com. *155, Sadashiv Peth Satara 415001 India.* www.antisuperstition.com. **Indian Rationalist Association,** India. Sanal Edamaruku. E-mail: edamaruku@vsnl.com or IRA@rationalist international.net. 779, Pocket 5, Mayur Vihar 1, New Delhi 110 091 India. Dravidar Kazhagam, southern India. K. Veeramani, Secretary General. Tel.: 9144-5386555; e-mail: periyar@vsnl.com. Periyar Thidal, 50, E.F.K. Sampath Road Vepery, Chennai Tamil Nadu 600 007 India. www.Periyar.org. **Indian CSICOP,** India, B. Premanand, Convenor. Tel.: 091-0422-872423; e-mail: dayamini@md4.vsnl.net.in. 11/7 Chettipalayam Road Podanur Tamilnadu 641 023 India.

ITALY. Comitato Italiano per il Controllo delle Affermazioni sul Paranormale (CICAP) Italy. Massimo Polidoro, Executive Director. Tel.: 39-049-686870; e-mail: polidoro@cicap.org. P.O. Box 1117 35100 Padova, Italy. *www.cicap.org.*

IRELAND. The Irish Skeptics Society c/o Paul O'Donoghue, 11 Woodleigh Elm, Highfield Rd., Rathgar, Dublin 6. Ireland; www.irishskeptics.net E-mail:contact@irishskeptics.net.

JAPAN. Japan Anti-Pseudoscience Activities Network *(JAPAN) Japan. Ryutarou Minakami, chairperson* E-mail: skeptic@e-mail.ne.jp. c/o Ohta Publishing Company, Epcot Bld, 1F, 22, Arakicho, Shinjuku-ku Tokyo 160-8571 Japan. **Japan Skeptics,** Japan. Dr. Jun Jugaku. E-mail: jugakujn@cc.nao.ac.jp. Japan Skeptics, Business Center for Academic Societies, Japan 5-16-9 Honkomagome, Bunkyo-ku Tokyo 113-8622 Japan.

KAZAKHSTAN. Kazakhstan Commission for the *Investigation of the Anomalous Phenomena* (KCIAP) Kazakhstan. Dr. Sergey Efimov, Scientific Secretary. E-mail: efim@afi.south-capital.kz. Astrophysical Institute Kamenskoye Plato Alma-Ata, 480020 Republic of Kazakhstan. Committee for the Scientific Expertise of Claims of the Paranormal (CSECOP).

KOREA. Korea PseudoScience Awareness (KOPSA) Korea. Dr. Gun-Il Kang, Director. Tel.: 82-2-393-2734; e-mail: KOPSA@chollian.net. 187-11 Bukahyun-dong, Sudaemun-ku, Seoul 120-190 Korea www.kopsa.or.kr.

MALTA. Society for Investigating the Credibility of Extraordinary Claims (SICEC) Malta. Vanni Pule, Chairman. Tel.: 356-381994; e-mail: pulevan @vol.net.mt. P.O. Box 31, Hamrun, Malta.

MEXICO. Mexican Association for Skeptical Research *(SOMIE) Mexico, Mario Mendez-Acosta, Apartado* Postal 19-546 D.F. 03900 Mexico.

NETHERLANDS. Stichting Skepsis, Netherlands. Jan Willem Nienhuys, Secretary. e-mail: jnienhuy @win.tue.nl. Dommelseweg 1A, 5581 VA Waalre, Netherlands.

NEW ZEALAND. New Zealand Skeptics, *New Zealand,* Vicki Hyde, Chair. Tel.: 64-3-384-5136; e-mail: Vicki@spis.co.nz. PO Box 29-492, Christchurch, New Zealand. www.skeptics.org.nz.

NIGERIA. Nigerian Skeptics Society, Nigeria. Leo Igwe, Convenor. E-mail: dpc@skannet.com.ng. PO Box 25269, Mapo Ibadan Oyo State, Nigeria.

NORWAY. SKEPSIS. Norway St. Olavsgt. 27 N-0166 Oslo, Norway.

PERU. Comite de Investigaciones de lo Paranormal lo Seudocientifico y lo Irracional CIPSI-PERU, Lima, Peru. Manuel Abraham Paz-y-Mino. Tel.: +51-1-99215741; e-mail: cipsiperu@yahoo.com. El Corregidor 318 Rimac, Lima 25 Peru. www.geocities.com/cipsiperu.

POLAND. Polish Skeptics, Poland. Adam Pietrasiewicz. E-mail: redaktor@iname.com. www.biuletynsceptyczny.z.pl.

PORTUGAL. Associaçao Cépticos de Portugal (CEPO) Portugal. Ludwig Krippahl. E-mail: cepo@interacesso.pt. Apartado 334 2676-901 Odivelas, Portugal. http://cepo.interacesso.pt.

RUSSIA. Dr. Valerii A. Kuvakin. Tel.: 95-718-2178; e-mail: V.KUVAKIN@MTU-NET.RU. Vorob'evy Gory, Moscow State University, Phil. Dept. Moscow 119899 Russia. http://log.philos.msu.ru/rhs/index/htm.

SINGAPORE. Singapore Skeptics. Contact: Ronald Ng. E-mail: ronaldng@iname.com.www.skeptic.iwarp.com.

SLOVAK REPUBLIC (SACT). Slovak Republic. Igor Kapisinsky Pavla Horova, 10 Bratislava 841 07 Slovak Republic.

SOUTH AFRICA. Marian Laserson. P.O. Box 46212, Orange Grove 2119 South Africa. **SOCRATES. South Africa. Cape Skeptics,** Cape Town. Dr. Leon Retief. *Tel.: 27-21-913?434; e-mail: leonr@iafrica.com. 5N* Agapanthus Avenue, Welgedacht Bellville 7530 South Africa.

SPAIN. El Investigador Esceptico, Spain. Felix Ares de Blas Gámez/Ares/Martinez, P.O. Box 904, Donostia-San Sebastian 20080 Spain. **ARP-Sociedad para el Avance del Pensamiento Crítico** ARP-SAPC Spain. Félix Ares de Blas. Tel.: 34-933-010220; e-mail: arp@arp-sapc.org. Apartado de Correos, 310 E-08860 Castelldefels, Spain. www.arp-sapc.org.

SWEDEN. Swedish Skeptics, Sweden. Dan Larhammar, professor chairperson. Tel.: 46-18-4714173; e-mail: vetfolk@physto.se. Medical Pharmacology BMC, Box 593, Uppsala 751 24 Sweden. www.physto.se/~vetfolk/index.html.

TAIWAN. Taiwan Skeptics, Taiwan. Tim Holmes, PO Box 195, Tanzu, Taiwan Perspective.

UNITED KINGDOM. The Skeptic *Magazine, United* Kingdom. Mike Hutchinson. E-mail: subs@skeptic.org.uk. P.O. Box 475 Manchester M60 2TH United Kingdom.

VENEZUELA. La Asociación Racional y Escéptica de Venezuela (A.R.E.V.), Guido David Nuñez Mujica, 10th Street, 13th av. corner, Mini centro comercial Oasis, Valera, Trujillo state, Venezuela. Web site: www.geocities.com/escepticosvenezuela.

United States

ALABAMA. Alabama Skeptics, Alabama. Emory Kimbrough. Tel.: 205-759-2624. 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 US. **Skeptics-Freethought Forum of Alabama**. Skeptics Freethought Forum, Richard Rich, 1801 Beech St. SE, Decatur, AL 35601-3511 US. E-mail: rrbama66@hotmail.com.

ARIZONA. Tucson Skeptics Inc. Tucson, AZ. James McGaha. E-mail: JMCGAHA@PimaCC.Pima.EDU. 5100 N. Sabino Foothills Dr., Tucson, AZ 85715 US. **Phoenix Skeptics**, Phoenix, AZ. Michael Stackpole, P.O. Box 60333, Phoenix, AZ 85082 US.

CALIFORNIA. Sacramento Organization for Rational Thinking (SORT) Sacramento, CA. Ray Spangenburg, co-founder. Tel.: 916-978-0321; e-mail: kitray@quiknet.com. PO Box 2215, Carmichael, CA 95609-2215 US. www.quiknet.com/~kitray/index1.html. **Bay Area Skeptics** (BAS) San Francisco—Bay Area. Tully McCarroll, Chair. Tel.: 415 927-1548; e-mail: tullyann@pacbell.net. PO Box 2443 Castro Valley, CA 94546-0443 US. www.BASkeptics.org. **Independent Investigations Group,** Center for Inquiry-West, 4773 Hollywood Blvd, Los Angeles, CA 90027 Tel.; 323-666-9797 ext 156; Web site: www.iigwest.com.

Sacramento Skeptics Society, Sacramento. Terry Sandbek, President. 4300 Auburn Blvd. Suite 206, Sacramento CA 95841. Tel.: 916 489-1774. E-mail: terry@sandbek.com. **San Diego Association for Rational Inquiry** (SDARI) President: Richard Urich. Tel.: 858-292-5635. Program general information 619-421-5844. Web site: www.sdari.org. Snail mail address: PO Box 623, La Jolla, CA 92038-0623.

COLORADO. Rocky Mountain Skeptics (RMS) Colo., Wyo., Utah, Mont. Béla Scheiber, President. Tel.: 303-444-7537; e-mail: rms@peakpeak.com. PO Box 4482, Boulder, CO 80306 US. http://bcn.boulder.co.us/community/rms.

CONNECTICUT. New England Skeptical Society (NESS) New England. Steven Novella MD, President. Tel.: 203-281-6277; e-mail: board@theness.com. 64 Cobblestone Dr., Hamden, CT 06518 US. www.theness.com.

D.C./MARYLAND. National Capital Area Skeptics NCAS, Maryland, D.C., Virginia. D.W. "Chip" Denman. Tel.: 301-587-3827. e-mail: ncas@ncas.org. PO Box 8428, Silver Spring, MD 20907-8428 US. http://www.ncas.org.

FLORIDA. Tampa Bay Skeptics (TBS) Tampa Bay, Florida. Gary Posner, Executive Director. Tel.: 727-209-2902; e-mail: tbs@cfiflorida.org; PO Box 8099, St. Petersburg, FL 33738 US. http://members.aol.com/tbskep.

GEORGIA. Georgia Skeptics (GS) Georgia. Rebecca Long, President. Tel.: 770-493-6857; e-mail: arlong@hcrc.org. 2277 Winding Woods Dr., Tucker, GA 30084 US.

IOWA. Central Iowa Skeptics (CIS) Central Iowa, Rob Beeston. Tel.: 515-285-0622; e-mail: ciskeptics@hotmail.com. 5602 SW 2nd St. Des Moines, IA 50315 US. www.skepticweb.com.

ILLINOIS. National Examination Association of Lincoln Land (REALL) Illinois. Bob Ladendorf, Chairman. Tel.: 217-546-3475; e-mail: chairman@reall.org. PO Box 20302, Springfield, IL 62708 US. www.reall.org.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES) Kentucky. Prof. Robert Baker, 3495 Castleton Way, North Lexington, KY 40502 US. Contact Fred Bach at e-mail: fredwbach@yahoo.com.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM) Louisiana. Marge Schroth. Tel.: 225-766-4747. 425 Carriage Way, Baton Rouge, LA 70808 US.

MICHIGAN. Great Lakes Skeptics (GLS) SE Michigan. Lorna J. Simmons, Contact person. Tel.: 734-525-5731; e-mail: Skeptic31@aol.com. 31710 Cowan Road, Apt. 103, Westland, MI 48185-2366 US. **Tri-Cities Skeptics**, Michigan. Gary Barker. Tel.: 517-799-4502; e-mail: barkerg@svol.org. 3596 Butternut St., Saginaw, MI 48604 US.

MINNESOTA. St. Kloud Extraordinary Claim Psychic Teaching Investigating Community (SKEPTIC) St. Cloud, Minnesota. Jerry Mertens. Tel.: 320-255-2138; e-mail: gmertens@stcloudstate.edu. Jerry Mertens, Psychology Department, 720 4th Ave. S, St. Cloud State University, St. Cloud, MN 56301 US.

MISSOURI. Gateway Skeptics, Missouri, Steve Best, 6943 Amherst Ave., University City, MO 63130 US. **Kansas City Committee for Skeptical Inquiry,** Missouri. Verle Muhrer, United Labor Bldg., 6301 Rockhill Road, Suite 412 Kansas City, MO 64131 US.

NEBRASKA. REASON (Rationalists, Empiracists and Skeptics of Nebraska), Chris Peters, PO Box 24358, Omaha, NE 68134; e-mail: reason01@hotmail.com; Web page: www.reason.ws.

NEVADA. Skeptics of Las Vegas, (SOLV) PO Box 531323, Henderson, NV 89053-1323. E-mail: rbanderson@skepticslv.org. Web site: www.skepticslv.org./.

NEW MEXICO. New Mexicans for Science and Reason (NMSR) New Mexico. David E. Thomas, President. Tel.: 505-869-9250; e-mail: nmsrdave@swcp.com. PO Box 1017, Peralta, NM 87042 US. www.nmsr.org.

NEW YORK. New York Area Skeptics (NYASk) metropolitan NY area. Jeff Corey, President. 18 Woodland Street, Huntington, NY 11743, Tel: (631) 427-7262 e-mail: jcorey@liu.edu, Web site: www.nyask.com. **Inquiring Skeptics of Upper New York** (ISUNY) Upper New York. Michael Sofka, 8 Providence St., Albany, NY 12203 US. **Central New York Skeptics** (CNY Skeptics) Syracuse. Lisa Goodlin, President. Tel: 315 446-3068; e-mail: info@cnyskeptics.org, Web site: cnyskeptics.org 201 Milnor Ave., Syracuse, NY 13224 US.

NORTH CAROLINA. Carolina Skeptics North Carolina. Eric Carlson, President. Tel.: 336-758-4994; e-mail: ecarlson@wfu.edu. Physics Department, Wake Forest University, Winston-Salem, NC 27109 US. www.carolinaskeptics.org.

OHIO. Central Ohioans for Rational Inquiry (CORI) Central Ohio. Charlie Hazlett, President. Tel.: 614-878-2742; e-mail: charlie@hazlett.net. PO Box 282069, Columbus OH 43228 US. **South Shore Skeptics** (SSS) Cleveland and counties. Jim Kutz. Tel.: 440 942-5543; e-mail: jimkutz@earthlink.net. PO Box 5083, Cleveland, OH 44101 US. www.southshoreskeptics.org/.

Association for Rational Thought (ART) Cincinnati. Roy Auerbach, president. Tel: 513-731-2774, e-mail: raa@cinci.rr.com. PO Box 12896, Cincinnati, OH 45212 US. www.cincinnatiskeptics.org.

OREGON. Oregonians for Rationality (O4R) Oregon. Dave Chapman, President. Tel.: 503 292-2146; e-mail: dchapman@iccom.com. 7555 Spring Valley Rd. NW, Salem, OR 97304 US. www.o4r.org.

PENNSYLVANIA. Paranormal Investigating Committee of Pittsburgh (PICP) Pittsburgh PA. Richard Busch, Chairman. Tel.: 412-366-1000; e-mail: mindful@telerama.com. 8209 Thompson Run Rd., Pittsburgh, PA 15237 US. **Philadelphia Association for Critical Thinking** (PhACT), much of Pennsylvania. Eric Krieg, President. Tel.: 215-885-2089; e-mail: eric@phact.org. By mail C/O Ray Haupt 639 W. Ellet St., Philadelphia PA 19119.

TENNESSEE. Rationalists of East Tennessee, East Tennessee. Carl Ledenbecker. Tel.: 865-982-8687; e-mail: Aletall@aol.com. 2123 Stonybrook Rd., Louisville, TN 37777 US.

TEXAS. North Texas Skeptics NTS Dallas/Ft Worth area, John Blanton, Secretary. Tel.: 972-306-3187; e-mail: skeptic@ntskeptics.org. PO Box 111794, Carrollton, TX 75011-1794 US. www.ntskeptics.org.

VIRGINIA. Science & Reason, Hampton Rds., Virginia. Lawrence Weinstein, Old Dominion Univ.-Physics Dept., Norfolk, VA 23529 US.

WASHINGTON. Society for Sensible Explanations, Western Washington. Tad Cook, Secretary. E-mail: K7RA@arrl.net. PO Box 45792, Seattle, WA 98145-0792 US. http://seattleskeptics.org.

PUERTO RICO. Sociedad De Escépticos de Puerto Rico, Luis R. Ramos, President. 2505 Parque Terra Linda, Trujillo Alto, Puerto Rico 00976. Tel: 787-396-2395; e-mail: Lramos@escepticospr.com; Web site www.escepticor.com.

The organizations listed above have aims similar to those of CSICOP but are independent and autonomous. Representatives of these organizations cannot speak on behalf of the CSICOP. Please send updates to Barry Karr, P.O. Box 703 Amherst NY 14226-0703.

SCIENTIFIC AND TECHNICAL CONSULTANTS

George Agogino, Dept. of Anthropology, Eastern New Mexico University
Gary Bauslaugh, educational consultant, Center for Curriculum, Transfer and Technology, Victoria, B.C., Canada
Richard E. Berendzen, astronomer, Washington, D.C.
Martin Bridgstock, Senior Lecturer, School of Science, Griffith University, Brisbane, Australia
Richard Busch, magician/mentalist, Pittsburgh, Penn.
Shawn Carlson, Society for Amateur Scientists, East Greenwich, RI
Roger B. Culver, professor of astronomy, Colorado State Univ.
Felix Ares de Blas, professor of computer science, University of Basque, San Sebastian, Spain
Michael R. Dennett, writer, investigator, Federal Way, Washington
Sid Deutsch, consultant, Sarasota, Fla.
J. Dommanget, astronomer, Royale Observatory, Brussels, Belgium
Nahum J. Duker, assistant professor of pathology, Temple University
Barbara Eisenstadt, psychologist, educator, clinician, East Greenbush, N.Y.
William Evans, professor of communication, Center for Creative Media
John F. Fischer, forensic analyst, Orlando, Fla.
Eileen Gambrill, professor of social welfare, University of California at Berkeley
Sylvio Garattini, director, Mario Negri Pharmacology Institute, Milan, Italy
Laurie Godfrey, anthropologist, University of Massachusetts
Gerald Goldin, mathematician, Rutgers University, New Jersey
Donald Goldsmith, astronomer; president, Interstellar Media
Alan Hale, astronomer, Southwest Institute for Space Research, Alamogordo, New Mexico
Clyde F. Herreid, professor of biology, SUNY, Buffalo
Terence M. Hines, professor of psychology, Pace University, Pleasantville, N.Y.
Michael Hutchinson, author; SKEPTICAL INQUIRER representative, Europe
Philip A. Ianna, assoc. professor of astronomy, Univ. of Virginia
William Jarvis, professor of health promotion and public health, Loma Linda University, School of Public Health
I. W. Kelly, professor of psychology, University of Saskatchewan
Richard H. Lange, M.D., Mohawk Valley Physician Health Plan, Schenectady, N.Y.
Gerald A. Larue, professor of biblical history and archaeology, University of So. California.
William M. London, Touro University, International
Rebecca Long, nuclear engineer, president of Georgia Council Against Health Fraud, Atlanta, Ga.
Thomas R. McDonough, lecturer in engineering, Caltech, and SETI Coordinator of the Planetary Society
James E. McGaha, Major, USAF; pilot
Joel A. Moskowitz, director of medical psychiatry, Calabasas Mental Health Services, Los Angeles.
Jan Willem Nienhuys, mathematician, Univ. of Eindhoven, the Netherlands
John W. Patterson, professor of materials science and engineering, Iowa State University
Massimo Pigliucci, professor in Ecology & Evolution at SUNY-Stony Brook, NY
James Pomerantz, Provost, and professor of cognitive and linguistic sciences, Brown Univ.
Gary P. Posner, M.D., Tampa, Fla.
Daisie Radner, professor of philosophy, SUNY, Buffalo
Robert H. Romer, professor of physics, Amherst College
Karl Sabbagh, journalist, Richmond, Surrey, England
Robert J. Samp, assistant professor of education and medicine, University of Wisconsin-Madison
Steven D. Schafersman, asst. professor of geology, Miami Univ., Ohio
Béla Scheiber,* systems analyst, Boulder, Colo.
Chris Scott, statistician, London, England
Stuart D. Scott, Jr., associate professor of anthropology, SUNY, Buffalo
Erwin M. Segal, professor of psychology, SUNY, Buffalo
Carla Selby, anthropologist/archaeologist
Steven N. Shore, professor and chair, Dept. of Physics and Astronomy, Indiana Univ. South Bend
Waclaw Szybalski, professor, McArdle Laboratory, University of Wisconsin-Madison
Sarah G. Thomason, professor of linguistics, University of Pittsburgh
Tim Trachet, journalist and science writer, honorary chairman of SKEPP, Belgium.
David Willey, physics instructor, University of Pittsburgh
*Member, CSICOP Executive Council

CENTERS FOR INQUIRY

www.centerforinquiry.net

INTERNATIONAL
P.O. Box 703, Amherst, NY 14226
Tel.: (716) 636-1425

WEST
4773 Hollywood Blvd., Los Angeles, CA 90027
Tel.: (323) 666-9797

METRO NEW YORK
1 Rockefeller Plaza, #2700, New York, NY 10020
Tel: (212) 265-2877

FLORIDA
5201 West Kennedy Blvd, Suite 124
Tampa, FL 33609
Tel.: (800) 398-7571

EGYPT
44 Gol Gamal Street
Agouza, Giza

FRANCE
Prof. Henri Broch,
Universite of Nice, Faculté des Sciences,
Parc Valrose, 06108, Nice cedex 2. France
www.unice.fr/zetetics/

NEPAL
Humanist Association of Nepal
P.O. Box 5284, Kathmandu, Nepal
tel: 011977 125 7610

PERU
D. Casanova 430, Lima 14, Peru

EUROPE
Dr. Martin Mahner
Arheilger Weg 11, D-64380 Rossdorf, Germany
Tel.: +49 6154 695023

MOSCOW
Professor Valerii A. Kuvakin
119899 Russia, Moscow, Vorobevy Gory,
Moscow State University, Philosophy Dept.

cfi Center for Inquiry International

"... to promote and defend reason, science, and freedom of inquiry in all areas of human endeavor."

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

The Lure of the Rings

Resembling a diamond-encrusted bracelet, a ring of brilliant blue star clusters wraps around the yellowish nucleus of what was once a normal spiral galaxy in this new image from NASA's Hubble Space Telescope (HST). This image is being released to commemorate the 14th anniversary of Hubble's launch on April 24, 1990 and its deployment from the space shuttle Discovery on April 25, 1990.

The sparkling blue ring is 150,000 light-years in diameter, making it larger than our entire home galaxy, the Milky Way. The galaxy, cataloged as AM 0644-741, is a member of the class of so-called "ring galaxies." It lies 300 million light-years away in the direction of the southern constellation Dorado.

Image Credit: NASA, ESA, and The Hubble Heritage Team (AURA/STScI)

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

The Committee is a nonprofit scientific and educational organization.
The SKEPTICAL INQUIRER is its official journal.

The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community, the media, and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues.

West Los Angeles, California
Peru Lima, Peru
Nigeria Oyo State, Nigeria
Metro New York Manhattan, New York
Europe Rossdorf, Germany
Nepal Kathmandu, Nepal
France Universite of Nice, France
Florida St. Petersburg, Florida
Moscow Moscow State University